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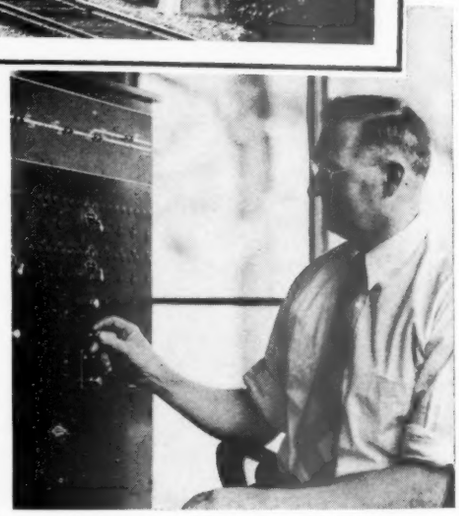
Increasing Capacity of Single Track

Expedites Traffic Through Bottle-Neck



"UNION" Centralized Traffic Control installed by the Pennsylvania R. R. to control switches and signals at each end of 4.5 miles of single track between Huntley and Sterling Run on the Renovo Division, has minimized delays on this bottle-neck and permits a free flow of traffic. The indications of the block signals at Huntley and Sterling Run supersede timetable superiority and take the place of train orders.

Increasing track capacity is but one important advantage of "Union" C. T. C. Why not investigate *all* of its advantages and benefits? Our representative will be glad to assist.

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RAILWAY AGE

Labor Relations Machinery That Promotes Injustice and Discord

Chairman Otto S. Beyer of the National Mediation Board, addressing the New York Railroad Club last Friday, made a plea for greater co-operation between organized labor and railroad managements in meeting the problems of the industry. He believes organized employees would extend this co-operation because they "greatly value" the high standards of wages and working conditions which have been accorded to them. Enlarging upon this point, he said:

"There is no industry in which the rights of the employees as wage earners are more firmly established than on the railroads. There is, for example, hardly a railroad employee whose rate of pay, hours and working conditions are not defined by labor agreements properly negotiated through representatives of his own choosing. . . . As a railroad employee grows older in the service his tenure of employment becomes more secure. He enjoys a system of retirement insurance more liberal than that of any other wage earner in industry. . . . In short, our railroad employees might well be said to be a preferred class of industrial workers who, given the proper incentives, will respond quickly to opportunities to enlarge their usefulness to their industry."

We believe that Mr. Beyer is correct in his assumption that, by and large, railway employees do appreciate their situation and that they are willing to express that appreciation tangibly to the industry if they are given an opportunity to do so. Unfortunately, however, much potential good-will is largely frustrated by labor politicians who apparently feel that more is to be gained by raiding the railroads than by co-operating with them. And there are imperfections in the existing legislative machinery for dealing with labor relations on the railroads which play right into the hands of such labor politicians.

The Law Is What Referees Say It Is

Indeed "imperfections" is too weak a word to describe the anti-social and morale-destroying racket which has grown up around the National Adjustment Board. This board is made up equally of representatives of management and organized employees. It adjudicates only those disputes which arise out of existing agreements and working rules. When the board cannot agree on the disposition of a case (which happens frequently, since management and employees are equally represented upon it) an outside referee is called in. If the board cannot agree upon a referee, the National Mediation Board appoints one. Whether these referees have at times been unduly legalistic, or prejudiced in favor of organized labor, or ignorant of actual conditions on the railroads, we shall not attempt to say. We do say, however, that some of these referees' awards, whatever their technical legality, smell to high heaven from any common sense standards of fairness. If they represent the actual law, then the law is an ass.

A Case on the Lehigh Valley

In January, 1936, the trainmen's and conductors' organizations filed claims (retroactive to March, 1933) demanding of the Lehigh Valley a full day's pay for conductors and trainmen who rode this company's incoming passenger trains from Pennsylvania Station, New York, to Sunnyside Yard, a distance of 3 to 5 miles, after the trains had discharged their passengers. Another full day's pay was demanded for riding outbound trains from the yard to the station. This compensation was sought in addition to the good wages received for handling these trains over the road.

Harm Many to Enrich a Few

From any standpoint, save perhaps that of technical legalism, these employees would have been more than amply compensated by an allowance of an hour's extra pay for each of these yard trips, which consumed on the average 10 or 15 minutes. A clearly worded working rule provided for an extra hour's pay for this service, but the referee nevertheless awarded a full day's extra wages for each one of these three-to-five-mile trips. The decision cost the railroad approximately a quarter of a million dollars. The Lehigh Valley is hard pressed financially, and such a fantastic payment for so little labor simply meant that it had to scrimp elsewhere to provide the money. For one thing, the management found it necessary to cancel its group insurance and relief arrangements. That is to say, in order to indulge a demand on the part of a handful of employees for several thousands of dollars apiece to which they were entitled, if at all, only by a legalistic technicality, the great body of employees had to forego the protection afforded them by the company's contributions to relief and group insurance.

In addition, the management was compelled as a measure of economy necessitated by increased operating expenses and the unprofitability of passenger business at present rates, to withdraw two trains from service, which occasioned a reduction in employment of some 50 men at the bottom of the seniority roster. Employees at the bottom of the seniority lists are the "forgotten men" in the ranks of organized railroad labor. Union policy treats them as if they did not exist, while it concentrates its efforts on enlarging the wages, shortening the hours and digging up "back pay" claims for the benefit of those members whose seniority status is secure. With the average railroad today, there isn't anything left for the stockholders, anyhow, so the "back pay" cannot be taken from them. Instead it usually has to come out of the pocket of the man at the bottom of the seniority list—and particularly in the maintenance departments—because there isn't anyone else to take it from.

To the credit of the employees of the Lehigh Valley be it said that they would have been willing to have settled this case "on the road" on a basis which would have been fair both to themselves, to the railroad and to their fellow-employees. But they were not permitted by union executives to make a local settlement. (We hear a lot of fine talk about the "democracy" of labor organizations, but there is precious little of an important nature that is left to local self-government in handling disputes where union executives suspect there may be "back pay" possibilities.)

Huge "Back Pay" for Work Not Done

This Lehigh Valley case is only one of scores which have been decided awarding huge sums in "back pay," in many cases for work not done at all, but which the unions have claimed should have been done under their interpretation of the rules and agreements. Unneeded switch engines have been ordered restored to service and compensation paid to employees for the time they were not operated. Turn-around runs have been ordered broken up into one-way runs of less than 100 miles. Unneeded work, and compensation for work not done, have been required—and necessary work by employees who would gladly give a dollar's worth of work for each dollar of compensation has suffered as a consequence.

Mr. Beyer says in effect that he believes most employees are grateful for the favorable conditions they have achieved, and we think he is right. But how can a spirit of gratitude and mutual co-operation between men and management flourish when settlement of disputes locally on the roads where they occur is either forbidden by union executives or is discouraged by the appeal to cupidity which has been aroused by excessive Adjustment Board awards? Even between employees, how can genuine co-operation possibly develop, when no consideration is ever shown to the men at the bottom of the seniority roster, while more and more favors are heaped upon those who are secure in their jobs and already have all they can in reason ask for in the way of good wages and favorable working conditions? How can co-operation among employees develop when shops have to be closed down and track maintenance work curtailed, in order to pay higher wages to train and engine service employees?

Laws That "Take Work", Not "Make Work"

Or take the matter of "full crew" bills, train limit bills and other "make work" legislation. Actually such measures do not "make work" at all. What they really do is "take work" from somebody else and give it to some specially favored group. Does any one in possession of his senses believe that the railroads need an extra brakeman on freight trains as much as they need the services of section men and shopmen? And yet, under present conditions of financial stringency, every extra man who is forced onto a payroll by political pressure means a man dropped somewhere else who would really do some work for the railroad to advance its economic welfare.

Beneath all the strife and bad feeling which exists on the railroads as the result of the activities of persons who seem to think they can prosper more from trouble than from co-operation, there remain the honest and self-respecting employees who so far have been mere pawns in other men's games. Given a framework of labor relations which would avoid discord, which would insure the settlement of disputes on the basis of justice rather than on the political power of the disputants, we believe the spirit of co-operation which Mr. Beyer urges would actually come into fruition.

Rewrite the Agreements!

There are some steps which can be taken to improve conditions without the necessity for any change in legislation. Management can and should take the necessary initial steps toward drawing up new working rules, which would contain the substance of the existing rules but be phrased by lawyers so that other lawyers could not find loopholes in them. The National Mediation Board might well also, we think, when it appoints referees, restrict itself to men of experience in railroad work.

But these changes alone will not suffice. It appears to be impossible under the law as it now stands for a railroad which believes it has been unjustly dealt with by a decision of the Adjustment Board to take the matter into court. Seemingly the only way to get one of these cases into court would be for a railroad to refuse to comply with an adverse order and require the employee to sue for the amount allegedly due him. But the labor organizations have adopted a policy of threatening a strike vote whenever a railroad has shown a disposition to get a court review in this manner. Clearly the right of court review of Adjustment Board decisions must be established if there is to be even an approximation of justice in the disposition of these cases.

The labor relations machinery on the railroads, however, has a lot more wrong with it than the excessive legalism in the handling of Adjustment Board cases. Fundamentally, the present system is a denial of the basic principle of collective bargaining itself. Collective bargaining presupposes that the bargaining power of the parties shall be approximately equal. Actually, however, the power is practically all on one side, that of organized labor. The labor organizations have all the economic power that the right to strike gives them. They have the further power also of political strength. In their present poverty-stricken condition the railroads have little economic power and, as events have amply demonstrated, they have no political power whatsoever. The managements are hamstrung on every hand by legal restrictions of which the unions are entirely free.

Force Substituted for Real Collective Bargaining

If the bargaining in connection with the wage increases granted last fall had been between parties of approximately equal strength, there would have been few or no wage increases. Neither advances in the cost of living, nor ability of the carriers to pay, nor increased productivity of labor justified any increases, except perhaps to some of the lowest-paid employees. That the increases were nevertheless granted simply indicates that these questions are no longer determined by striking a balance between contestants of equal power, nor yet by a judicial weighing of the merits of the point at issue. Instead, the method now used is the imposition of the will of the stronger upon that of the weaker party.

The result is that labor costs have been increased without regard to merit, and that railway owners and railway patrons have to pay these increased costs, without any real opportunity of defending themselves.

Benefits of Railway Labor Act Exaggerated

The working of the Railway Labor Act has been lauded too much within recent months. The peaceful settlements between railway managements and organized labor have been emphasized in contrast with the sitdown strikes and other disturbances that have occurred in other industries under the Wagner National Labor Relations Act. If collective bargaining under the Railway Labor Act works so well, why are certain labor unions doing their utmost to get Congress to pass the train limit bill, instead of submitting the question of limiting the length of trains to collective bargaining with railway managements? And, if the settlement of disputes regarding railway wages and working conditions has been so "satisfactory," why is it that the average railway wage for each hour actually worked is now the highest in history, while the net operating income being earned by the railroad industry is yielding a smaller return upon each dollar of investment than in almost any year in history and is yielding less than no return at all for the owners of the railroads, i.e., their stockholders?

Peace in railway labor relations is desirable. But peace which redounds entirely to the advantage of a greatly reduced number of employees at the cost of unemployment for many thousands of former employees, and which threatens to become the peace of the grave for railroad stockholders, is not desirable; and no settlement under the Railway Labor Act which in future results in peace at such a price should be called "satisfactory."

Re-establish the Railroad Labor Board

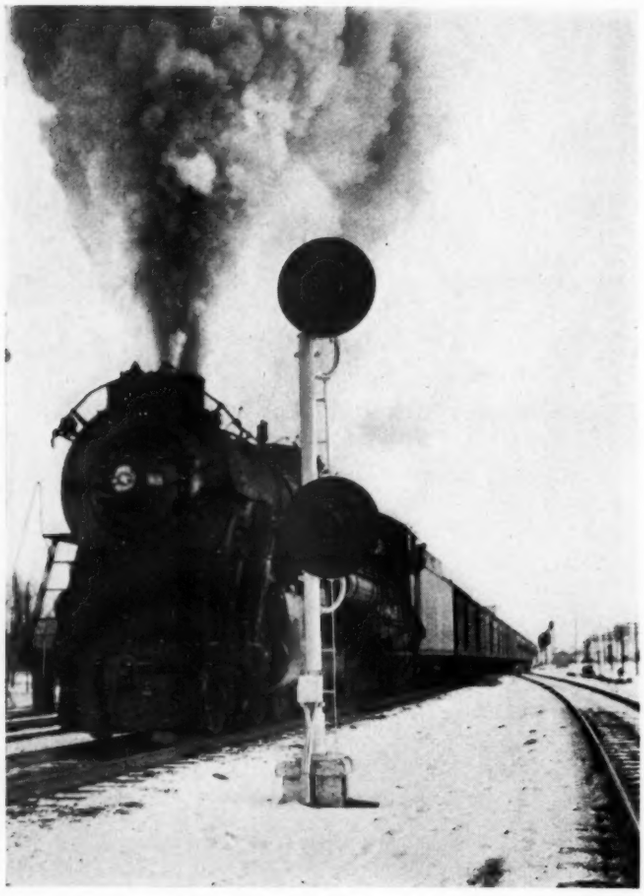
The general public has a vital interest in railway labor costs because—

1. If these costs are unjustifiably high, the returns on railway securities, which are widely distributed among the public, will be correspondingly low unless railway passenger and freight rates are made excessively high. Those who invest in the railways must be given as much consideration by railway regulation and railway management as those they employ if private ownership and management of railways are to be maintained. The way that the private capital already invested is treated will determine how much of it will be invested in future. A large future investment must be made if the railways are to effect essential economies and improvements in their service. Owners of private capital will not make it unless the management of the industry shows the courage and gets the backing necessary effectively to resist continued administration of the Railway Labor Act and other laws regulating the railways as if railway capital has no rights as compared with railway labor.

2. Extortionate labor costs are bound ultimately to either make rates excessive or render it necessary for the government to take over the railways and pay their losses from taxes.

3. Labor at the bottom of the seniority roster, although a numerical minority, nevertheless has a right to demand that wage rates be not increased out of all reason, with the inevitable corollary that the men at the bottom of the seniority lists lose their jobs.

The present labor relations machinery, which provides for the settlement of all issues by conference between politically impotent and legally hamstrung managements on the one hand and powerful national labor organizations on the other, leaves entirely out of consideration other parties who are vitally interested in the outcome of such negotiations—namely, the rate-paying public, the security-owning public and the railway and industrial employees whose jobs are at stake in these negotiations. It is difficult to see how equity and fairness to all these parties can be secured short of the re-establishment of such a tribunal as the Railroad Labor Board, which was created by the Transportation Act of 1920 to assure a hearing to every interest, and to prevent dictation by a powerful minority, overriding the rights of all other parties.



Westbound Passenger Train Passing Eastward Signal at Brush, Colo.

C. T. C. on Complete Su

Project includes 112 miles of single track, 105 miles of which is controlled by one machine

By W. F. Zane

Signal Engineer,

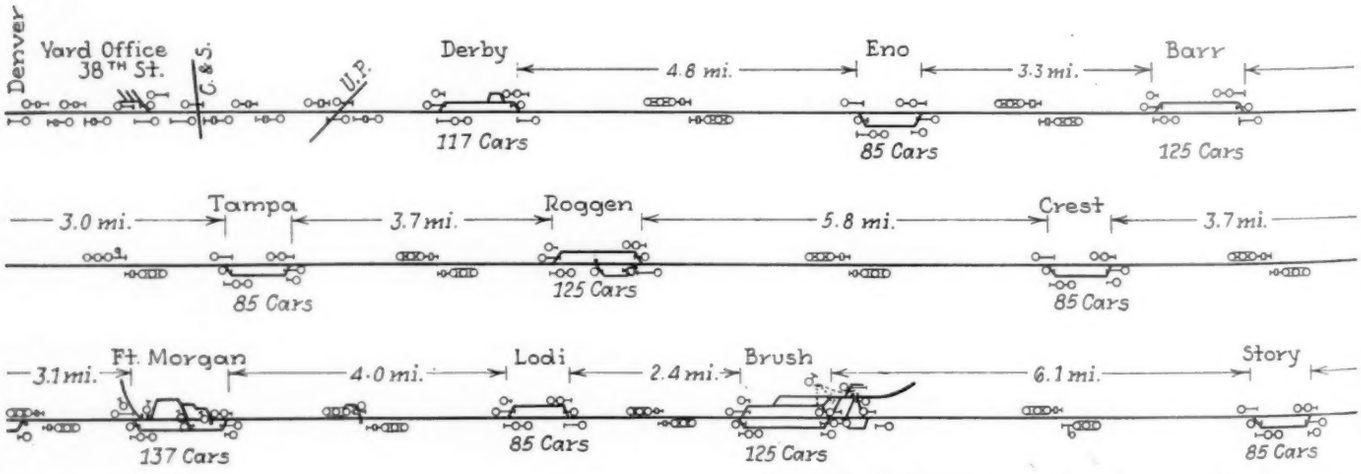
Chicago, Burlington & Quincy

AN installation of centralized traffic control that includes an entire subdivision has recently been placed in service on 112 miles of single track on the Chicago, Burlington & Quincy between Akron, Colo., and Denver. The 105-mile section between Akron and Derby is controlled from one machine at Brush, Colo., this being the longest C. T. C. section in the world operated by one man. This installation is of further interest because it includes several modern refinements in apparatus, as well as continuous indication of the location of all trains on main tracks, and automatically-controlled electric switch locks on certain hand-throw main-line switches.

Traffic and Character of the Line

This subdivision handles traffic in and out of Denver from three Burlington routes. The Chicago-Omaha-Lincoln-Denver main line joins with the St. Louis-Kansas City-Denver line at Oxford Junction, Neb., beyond which point the traffic of both routes is handled on the one single-track line to Denver by way of Akron. In addition, the Sterling division from Alliance, Neb., and Billings, Mont., connects with the main line at Brush, 88 miles east of Denver.

The line between Akron and Denver traverses typical western plains country. The elevation increases gradually from 4,234 ft. at Brush to 5,183 ft. at Denver, although ranges of sand hills lead to variations in the grade. The maximum ascending grade westbound varies from 0.5 per cent to 0.65 per cent for about 9 miles through Keenesburg, Colo., while the maximum ascending grade eastbound is 0.6 per cent to 0.7 per cent for about 8 miles through Xenia. The line is tangent for



Track and Signal Plan of the Denver-Akron Territory Showing

te Subdivision of the Burlington

extended sections, one tangent being 15 miles and two 10 miles long. Besides one 2-deg.-30-min. curve and two 2-deg. curves, all at summits, there are twenty-three 1 deg. curves. In 1914, this subdivision was equipped with two-position, lower-quadrant, automatic block signals, using home and distant signals controlled by the A. P. B. system. Train movements were directed by time table and train orders, with automatic signal protection.

In considering the operation of the track facilities, it was decided that all passing siding switches were to be equipped with power machines and signals for directing train movements, for past experience had shown that the policy of equipping certain sidings only to fit existing train operation would not be satisfactory. A change in schedules, an increase in traffic, trains running late, and extra sections of trains, create conditions that may make it desirable to make meets or passes at any siding on short notice, in order to derive the maximum benefit in advancing trains. For these reasons, all passing track switches and the junction crossover at Brush were equipped with power machines, and a spring switch with facing-point lock was installed at the departure end of the yard lead at Brush.

Siding Facilities

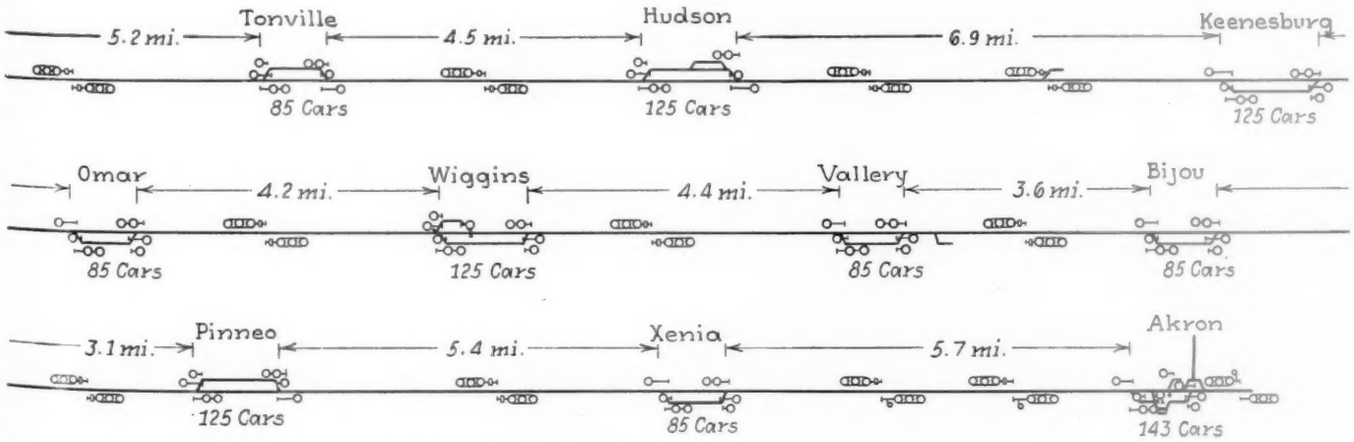
A study was then made of the capacities of the sidings as compared with the average and maximum lengths of trains, consideration being given to the desirability of having the sidings longer than the average train in order to permit non-stop meets. At Brush a new 125-car siding was constructed on the south side of the main line, leaving the old siding on the north as an additional yard track. At Akron, the west end of the siding was extended, increasing the capacity to 143 cars. Also, the sidings at 18 other locations were extended, the general idea being to have every second siding with 125-car capacity and the alternate sidings with 85-car capacity. The capacity of each siding and the length of main track between switches are indicated on the accompanying diagram. In order to raise the speed limit and thus expedite train movements through the turnouts at these sidings, the No. 11 turnouts were replaced with No. 15 turnouts with 24-ft. switch points, thus permitting train speeds of 25 m. p. h. Where 90-lb. rail was not in service on sidings, the rail was relaid with 90-lb., and the ties and ballast were replaced as necessary.

New Signaling Arrangement

In making the change to C. T. C. operation, the semaphore automatic block signals were removed, all signals on the new installation being of the color-light type. The signals controlled by the C. T. C. for directing train movements are located at or near main-line passing-track switches, with the exception of the two signals east of Brush. This extra set of signals was provided so that trains could stop on the main line at Brush station, or could take coal and water, without occupying the Brush-Story block, the advantage being that other trains could, at the same time, be moved from Story.

The searchlight dwarfs, for directing trains to pull out of sidings, display three aspects. When the switch is reversed and the next signal, which is the intermediate automatic, is clear, a train leaves the siding on a green indication. If the next signal is displaying red, then the dwarf signal displays yellow, and the train leaves with the standard approach indication. The advantage of the third aspect for these dwarfs is that, when a green indication is displayed, a train can pull out promptly and accelerate to normal speed without waiting to get to the next signal for a clear aspect.

The important industry, house and side tracks, other than controlled passing sidings, are protected by dwarf signals having the same indications and controls as the signal leaving a passing siding. In addition to this signal, each of these switches is protected by a Union electric switch lock, which is equipped with an indicator showing "locked" or "unlocked," in accordance with existing main track block conditions. A train on the



Car Capacities of Sidings and Lengths of Main Line Between Sidings

Electric Switch Locks Are Used at Certain Main Line Switches

main line, which has switching to do on one of these tracks, is stopped on a short unlocking track section, before the electric lock is released. If a train is on the industry track, and if no other train is approaching on the main line in either direction between the next control signals each way, and if the control signals protecting this part of the main track are at stop, a trainman can unlock the switch lock and the train can leave the siding on the indications of the dwarf signal. With this arrangement, these locks are semi-controlled by the dispatcher, because, in addition to obtaining authority over the telephone to use this switch, the dispatcher has to place the nearest governed signal, in each direction, in its most restrictive indication, before the electric lock can be used, thus eliminating the possibility of trains entering upon the main line without authority.

In addition to the switches where electric locks are used, numerous main-line switches in this territory lead to spurs used a few weeks each year for loading cars with sugar beats. When the beet season is finished, the frogs and points of these turnouts are removed from the main track. No electric locks are provided on these switches. While they are in service, a telephone is placed at each location for communication between train crews and the dispatcher.

Extent of C. T. C. and Location of Control

From an operating standpoint, the subdivision is divided into two distinctively different sections. On the 105-mile territory between Akron and Derby, the train operation is typical of that on a single-track line. However, the 7.6-mile section between Derby and Denver handles numerous switching operations. It was decided, therefore, that the Akron-Derby section should be handled by one C. T. C. machine. The dispatchers for the Denver-McCook division, 255 miles, were formerly located at McCook, and it was logical to move these dispatchers to Brush to handle the C. T. C. machine at that point and also to continue to dispatch the remainder of their division, from Akron to McCook, 143 miles, by train orders.

The machine is located in a room 17 ft. by 18 ft. 10 in., in the modern fireproof station at Brush, a portion of the large baggage room having been partitioned off with a wall of hollow tile. The C. T. C. control machine was made up in three panels totaling 10 ft. in length, the two end sections, each 2 ft. 6 in. long, being set at an angle of 105 deg. with the center panel so that the dispatcher can reach any lever without leaving his chair. A table, of the type used by dispatchers for handling train sheets, is located opposite the C. T. C. machine so that the dispatcher can turn quickly on his swivel chair to give his attention either to the control machine for the Akron-Denver territory or to the train sheet used for the McCook-Akron territory. The ringing apparatus for the telephone train dispatching system is located on this table.

One dispatcher's telephone circuit serves all the stations on the McCook-Akron territory, and is extended to the office at Brush for exclusive use in handling train orders on that section. Another circuit starts at Akron and extends to Denver, being connected to telephones at the switches in the C. T. C. territory as well as in the offices. Each circuit is equipped with a separate loud speaker.

Special Features of the Control Machine

The Union Switch & Signal Company's time-code system is used to effect the controls and bring in the indications. For this purpose, one two-wire circuit extends east from Brush to Akron, and another two-wire circuit extends west from Brush to the west end of Derby passing track. The C. T. C. control machine includes several new and interesting features. The track-indication lamps in the illuminated track diagram are normally extinguished, and are lighted to indicate the occupancy of each section of the main track throughout the installation. This feature is different from the earlier practice of indicating track occupancy of only the OS sections at switches and the approaches to each switch. The 44 two-position switch levers and the 42 three-position signal levers, as well as the indication lamps for each lever, are of the same general appearance and arrangement as on similar types of machines previously installed. The machine includes separate indication light, below each code-starting button, to show when the a-c. power is off at each individual passing track switch layout.

Another special feature is the provision made for the dispatcher to get in touch with maintainers when they are on the road. On the track side of the instrument house at each power switch location, there is a metal lamp body with a clear lens directed across the track

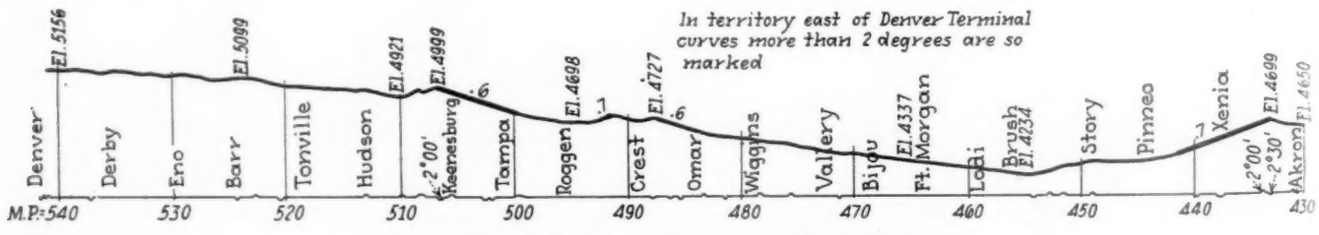


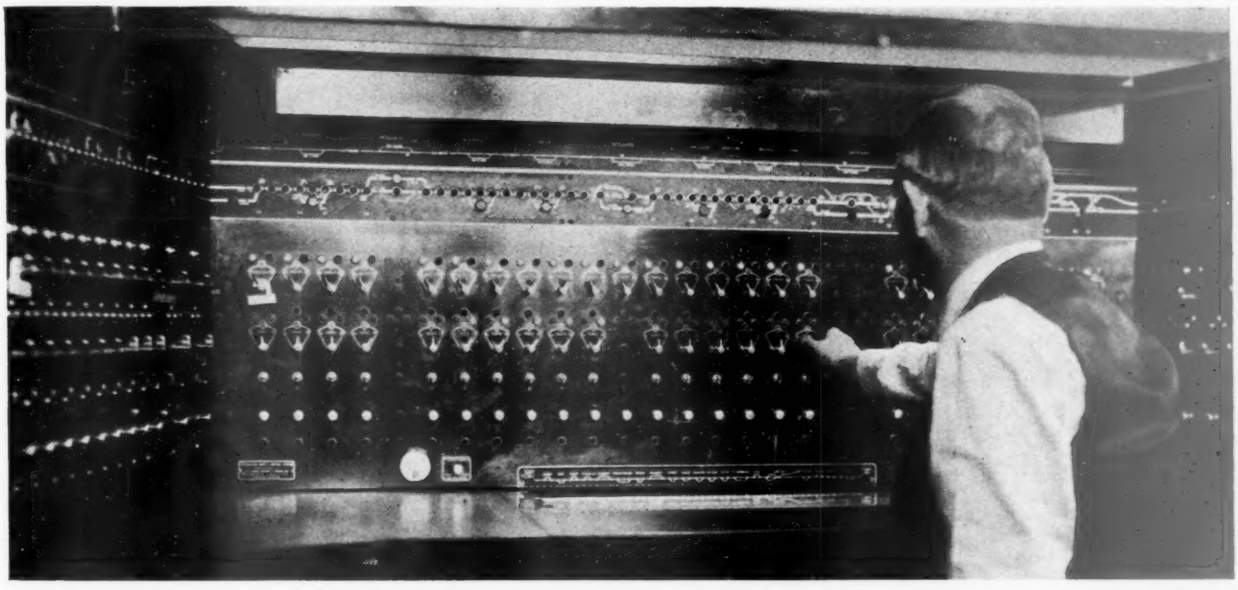
Chart of Profile and Curves on Entire Subdivision

at a height level with the eye of a man on a motor car. When a maintainer is wanted, the dispatcher operates the toggle switch located on the control panel just below the signal lever for the signals at the switch where the maintainer is likely to pass. The dispatcher pushes the code-starting button, and the code causes the call lamp at the corresponding field location to be lighted. The maintainers watch these lamps as they pass or are working in the vicinity of the instrument houses.

A record of train movements over the C. T. C. territory is made by an automatic graph located at the center of the control panel in a compartment depressed below the level of the desk. The graph paper, which is ruled horizontally with red ink to indicate divisions of time, is moved under the pens, at the rate of 3 in. per hr., by an electric clock mechanism. Forty-five pens are provided to correspond to the OS sections at each of the end-of-siding layouts and each approach section to the chanical locking between levers is used. The operator in control of this machine works under the direction of the dispatcher, and the systems are interconnected for the control of the westbound signal at the west end of Derby.

In order to adapt the signaling to the existing switching and train operations, the control of the signals was arranged to divide the Derby-Denver territory into two controlled blocks, one from the limits of the interlocking at Denver station to a point just west of the yard entrance switch at 38th street, and the second from 38th street to the signals at the west switch at Derby. The control of the signals in this section is similar to a check-locking arrangement, but the result obtained, in directing train movements by signal indication without train orders, is the same as on the remainder of the division between Derby and Akron.

Line circuits are carried in two Okonite cables, one



Power Switches and Signals for Directing Train Movements on 105 Miles of Single Track Are Controlled From One Machine

C. T. C. territory. Normally each pen makes a continuous vertical green line on the paper. When a train enters an OS section, the corresponding pen moves to the right and does not return to normal position until the rear of the train clears that OS section. By drawing lines to connect the OS indications made by a train, the record of its movement over the division is completed.

The Derby-Denver Section

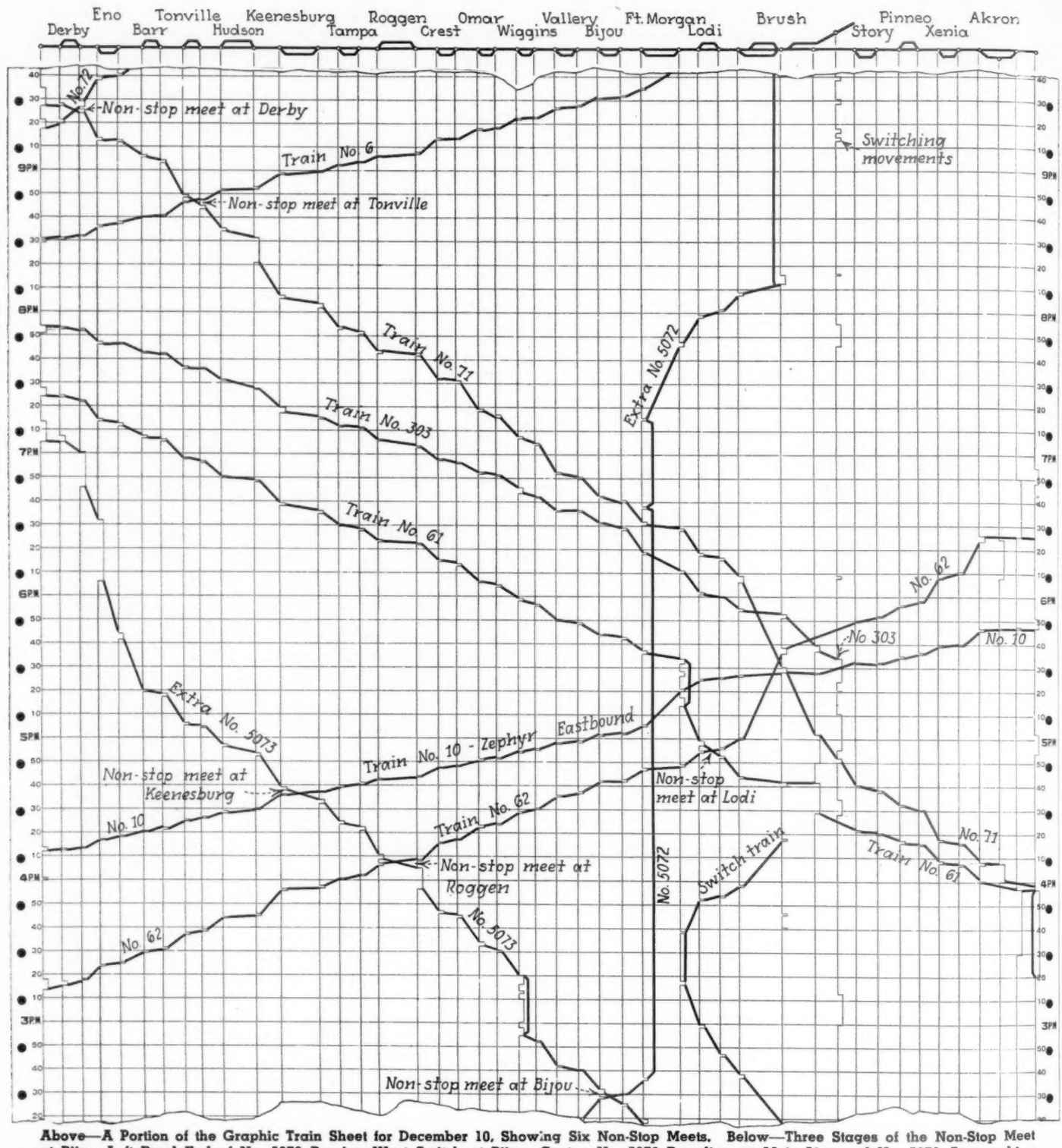
The 7.6-mile section between Derby and the passenger terminal in Denver includes connections with the freight yards at 38th street, and switches leading to other yards and numerous industries, as well as interlockings at crossings with the Union Pacific and the Colorado & Southern. The westbound yard-limit board is located at the west switch at Derby, and Rule 93 is in effect from there west to Denver. On account of the many switching movements and the complications of the interlockings, it was arranged for the signals, which direct train movements in this 7.6-mile section, to be controlled by the operator in the office at 38th street, rather than controlling this territory directly by the machine at Brush. The machine at 38th street includes two desk-type levers equipped with electric lever locks, but no me-

for code circuits and the other for signal controls. Electrostatic tests of the code cable showed an average of 0.14 m. f. per mile as the electrostatic capacity between wires.

Storage batteries on floating charge are used throughout the installation, all of these batteries being Exide lead type of different capacities as required. The power wires, for floating charge of batteries on the entire territory, are located on the two track pins on the lower arm of the pole line. The power line is sectionalized at points three miles apart, using G. E. fused cut-out plugs.

Results in Improved Train Performance

Although this installation of centralized traffic control has been in service, as a whole, only since December 7, and traffic has been comparatively light during this period, the improvement in train operation is evident. A study of the train schedules indicates, in part, why this benefit should be comparable with the results attainable by the addition of a second track. The preponderance of traffic is westbound from midnight to noon, to give morning arrival and deliveries in Denver; conversely, the preponderance of traffic is eastbound from 2:30 p.m. to midnight, providing late afternoon and evening departures from Denver. In the midnight-noon period



Above—A Portion of the Graphic Train Sheet for December 10, Showing Six Non-Stop Meets. Below—Three Stages of the Non-Stop Meet at Bijou: Left Read End of No. 5072 Passing West Switch at Bijou: Center, No. 5072 Receding on Main Line and No. 5073 Approaching on Siding; Right, No. 5073 Pulling Out at West Switch

there are six scheduled westbound trains, as compared with two eastbound, while in the 2:30 p.m.-midnight period there are seven eastbound and two westbound trains.

With all trains starting when ready to go, the circumstances outlined above indicate that there should be a larger percentage of passes than meets. As a matter of fact, passing moves at outlying sidings were not predominant under train-order operation, but this was true to some extent because of the difficulty of timing such passes under the timetable and train-order system, since a considerable period expired from the time that the dispatcher knew a freight train was ready to depart until orders could be issued and delivered. Furthermore, allowances had to be made for delays in entering sidings with hand-throw switches, and also to conform with the rule that second-class trains had to clear the main line 10 min. in advance of the scheduled arrival of first-class trains, such as the Zephyr. As a result, it was not practicable to let a freight train out of Denver, Akron or Brush ahead of a first-class train, unless time was available for the freight to be advanced a considerable distance. Therefore, it is evident that the use of C. T. C. to permit the dispatcher, on short notice, to direct these trains to start as soon as they are ready, is a decided help. Furthermore, experience since the installation has been in service indicates that the movement of a freight train over the subdivision, with reference to the meets it makes with other trains, can be so facilitated that the freight can be kept moving a comparatively short time ahead of a passenger train. The result is that not only the departure delays have been reduced, but the passing moves, other than at Brush or Akron, are not as numerous as might be expected.

On December 8, eastbound manifest freight train No. 62 left Denver at 3:15 p.m., westbound freight No. 61 left Brush at 3:30 p.m., and eastbound Zephyr No. 10 left Denver at 4:00 p.m. The two freight trains met at Crest, and No. 62 went to Akron ahead of the Zephyr. When the Zephyr was passing Tonville, No. 61 left Crest, and in 12 min. went to Roggen to meet the Zephyr, neither train stopping. About 45 min. was saved for No. 61 in these moves, as compared with what could have been done with train orders. On another day, No. 61 left Akron and No. 62 left Brush about the time the eastbound Zephyr passed Ft. Morgan. Number 61 took siding at Story for 11 min., to let No. 62 and also the Zephyr pass, No. 62 arriving at Akron 2 min. ahead of the Zephyr. Under the previous method of operation, the dispatcher did well to get the eastbound manifest train No. 62 as far as Brush ahead of the eastbound Zephyr at 5:11 p.m. Now No. 62 is usually advanced through Brush to Akron ahead of the Zephyr, and this means more than shows on the train-sheet figures, because the waiting time at Akron can also be used for changing engines and crews, and would be thus required later if the train had not been advanced to Akron. During the second trick on December 10, there were six meets, and in five of these meets neither train stopped. A sixth meet would have been non-stop except for the fact that a freight train had a pick-up to make.

The benefits of C. T. C. are especially noticeable in clearing up congestion of trains caused by a disruption of the track for a few hours. About 2 a.m. on December 9, an arch bar on a truck of a freight car failed, blocking the main line for several hours. That afternoon, between 4 p.m. and 5 p.m., four eastbound freights, one westbound freight, and the eastbound Zephyr, were on the line between Wiggins and Brush, 24 miles, and the meets and passes were arranged so closely that none of the trains was delayed seriously. Soon after the entire territory was placed in service, the time saved by trains, especially freight trains, became pronounced, as indicated in the accompanying table for 11 days of January.

The installation of the C. T. C. system was planned and installed by forces of the Burlington.

Benefits in Train Operation Effected by C. T. C.

Date Jan.	Trains	Train Advanced	Time Saved
1	61 and 10	61 Brush to Ft. Morgan	30 min. to 61
1	71 and 303	71 Brush to Bijou	35 min. to 71
2	72 and 2	72 Brush to Story	35 min. to 72
2	67 and 68	67 Crest to Tampa	35 min. to 67
2	68 and 1	68 Pinneo to Story	20 min. to 68
2	67 and 3	67 Keenesburg to Tonville	25 min. to 67
2	61 and 10	61 Vallery to Omar	40 min. to 61
3	X-6321 and 67	67 Keenesburg to Tampa	30 min. to 67
3	X-6321 and 3	X-6321 Ft. Morgan to Brush	35 min. to X-6321
3	61 and 10	61 Keenesburg to Hudson	30 min. to 61
3	71 and 10	71 Brush to Ft. Morgan	30 min. to 71
5	62 and 10	62 Story to Akron	35 min. to 62
5	71 and 303	71 Brush to Wiggins	40 min. to 71
5	71 and 6	71 Barr to Eno	25 min. to 71
6	X-6314 and 3	X-6314 Wiggins to Vallery	25 min. to X-6314
6	62 and 10	62 Brush to Xenia	35 min. to 62
7	67 and 72	67 Ft. Morgan to Bijou	20 min. to 67
8	68 and 301	68 Wiggins to Bijou	20 min. to 68
8	67 and 68	67 Hudson to Tonville	25 min. to 67
9	68 and 301	68 Vallery to Bijou	20 min. to 68
9	62 and 10	62 Brush to Story	25 min. to 62
9	61 and 10	61 Xenia to Pinneo	35 min. to 61
9	71 and 6	71 Derby to 38th St. Yard	25 min. to 71
9	61 and 6	61 Barr to Eno	20 min. to 61
10	68 and 3	68 Vallery to Ft. Morgan	25 min. to 68
11	67 and 68	68 Roggen to Keenesburg	35 min. to 68
11	68 and 301	68 Crest to Omar	20 min. to 68
11	62 and 10	62 Omar to Brush	40 min. to 62

Date Jan.	Trains	Non-Stop Meets
2	67 and 68	Tampa
3	61 and 10	Hudson
4	9 and X-2841	Crest
5	61 and 10	Barr
6	X-6314 and 301	Bijou
6	61 and 62	Roggen
6	61 and 10	Barr
6	303 and 6	Derby
7	3 and 68	Omar
7	301 and 68	Wiggins
8	61 and 62	Keenesburg
9	68 and 3	Wiggins
11	61 and 62	Omar
11	61 and 10	Crest
11	71 and 6	Roggen
11	71 and 72	Keenesburg
11	71 and 302	Tonville

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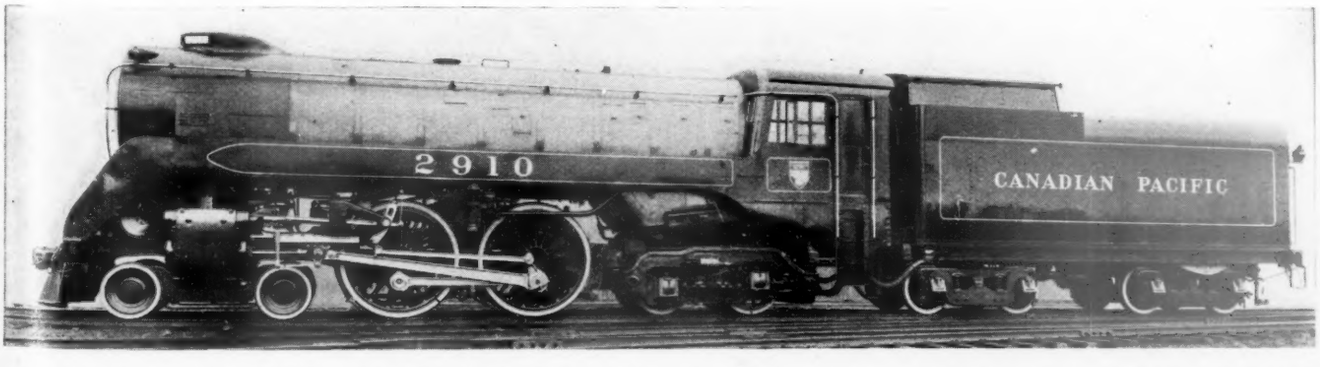


One of 20 Semi-Streamlined Locomotives Built for the Canadian Pacific By the Canadian Locomotive Company—These Locomotives, With a Total Weight of 240,000 Lb., Develop a Tractive Force of 26,000 Lb.

The Lounge Car — One of the 29 Units, Including Diners and Chair Cars, Built by A. C. F.

M. K. T. Places New Passenger Cars in Service

Interior decoration and arrangement of 29 cars built by A. C. F. provide maximum in comfort and convenience

THE Missouri-Kansas-Texas recently placed in service on through trains 29 new units of passenger equipment built at the St. Charles, Mo., shops of the American Car and Foundry Company. These consist of three dining cars, one lounge car and 25 chair cars.

Structurally these cars follow the general design and construction of standard equipment previously built for the Katy except that Cor-Ten steel has been used for side sheathing, letterboards and window frames. The cars have cast-steel double body bolsters and anti-telescoping end frames; all are equipped with Type-E couplers and A. C. F. centering devices with sliding pipe carriers. They have six-wheel trucks and cast-steel truck frames having center bolsters cast integral with the cross bolsters; drop equalizers are used on these trucks. The equalizer springs are of the friction-unit type. Center plates are fitted with compression grease cups for high-pressure lubrication.

The main side windows are equipped with double brass sash of conventional design permitting opening in emergency. The inside sash and the end doors are glazed with shatterproof glass, a modern safety feature.

In the selection of furniture, floor coverings, window curtains, lighting fixtures and color schemes, nationally known interior decorators combined their talents with engineers of the railroad and A. C. F. to secure an atmosphere both comfortable and attractive.

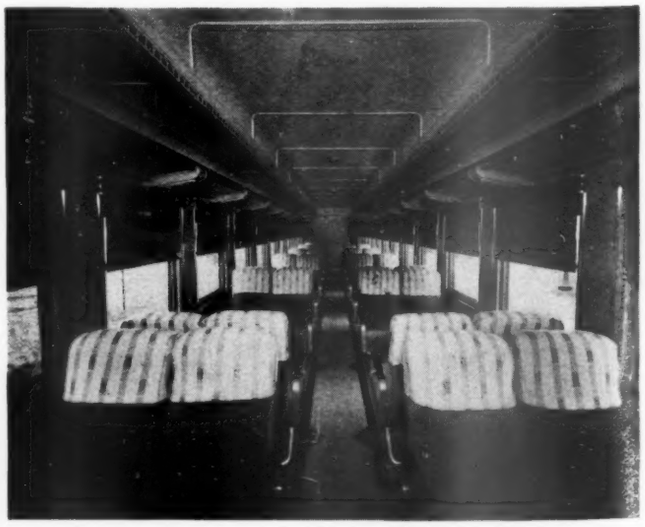
The Chair Cars

The chair cars are finished in a combination of soft green tones with black and satin aluminum finish for contrast. The side-wall color is a restful light green and the ceilings are white with a tinge of green. The lower side walls below the windows are covered in apple-green linoleum.

The floor covering of rubber applied over cork flooring is in three patterns; the main color is two-tone green with narrow black border strips and red triangular inserts in the aisle. Curtain boxes are finished in a somewhat darker green than the side walls, with the color outlined in satin aluminum border stripes. Aluminum molding strips also extend downward on the window finish to the black satin-finish window capping.

These cars have a seating capacity of 44 in the main compartment, three in the women's lounge and five in the men's smoking room.

A. C. F. rotating seats with individual reclining backs were selected for the main compartment. The mechanism permits rotating the seats to face the side windows and 45 deg. in either direction, as well as to the usual positions. These seats are upholstered in green plush with black Bakelite arm rests and satin aluminum frames and edge moldings. The soft spring backs are removable for cleaning. The saddle-type rubber cushions are



The Main Compartment of the Chair Cars Seats 44 Passengers and Has Chairs Which Can Be Rotated to Face the Windows

soft and comfortable. Foot rests are of stainless-steel-clad tubing, satin finished.

In the lounge and smoking rooms are comfortable arm chairs in natural walnut finish, upholstered in light green patterned mohair for the women's lounge and in green leather for the smoking room. A large comfortable sofa, leather covered to match the chairs, is also placed in the smoking room.

Generous locker space is provided at the men's end of the car for pillows, section tables and for the porter's use. Section tables are covered with black Micarta and have chrome-satin-finish tubular hinged legs. Table plates are arranged for three positions to provide correct location with the seat facing in either direction or centered for use with two seats facing each other.

Filtered drinking water is cooled by an electric cooler placed in the main passenger compartment against the bulkhead at the men's end.

Luggage racks for hand baggage are continuous with tubular rods and square lattice grilles, satin aluminum finished. In the bracket, finished wall color, is incorporated an individually controlled light fixture, having prismatic glass lens furnishing soft restful light for reading. A blue-tinted bulb in this fixture provides for night lighting.

The luggage-rack lights are supplemented by four center ceiling fixtures of a rectangular shape with glass shades and satin aluminum finished frames. Lights in the men's smoking room and women's lounge are of the side-wall type with tubular shades and satin aluminum finished fixtures. Step lights are applied at each step controlled by a trap-door switch.

The Ladies' Lounge on the Chair Cars

The Dining Cars

The dining cars are finished in colors having soft tones which enhance the appearance of the furnishings, the side walls in two-tone gray and the ceiling in a pale rose color. The window capping is finished in satin black.

Venetian blinds are applied at all side windows, thus avoiding the glare of direct sunlight and allowing sufficient indirect light for daytime operation. For night operation, indirect center lighting fixtures and tubular bracket fixtures over the dining tables furnish soft well diffused light.

The floors are heavily carpeted over sponge-rubber carpet pads, the carpet being of a pleasing pattern blending into the general decorative scheme of the car.

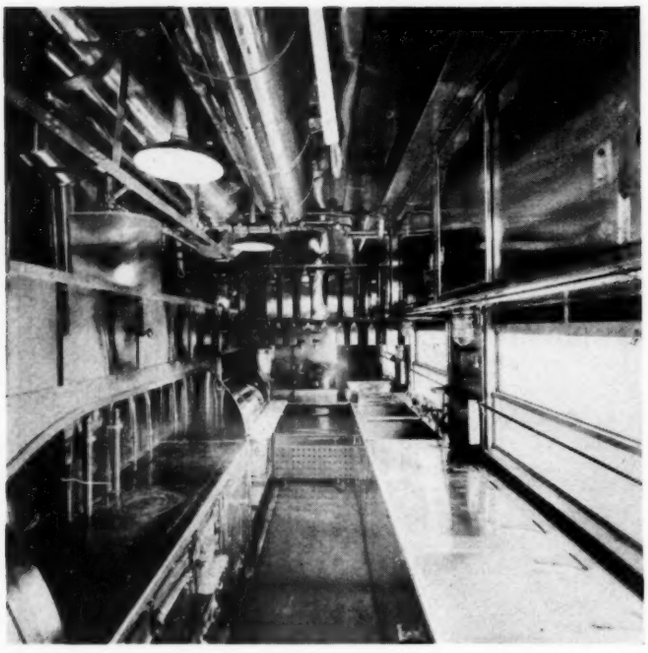
The dining tables are finished with satin black plastic composition with chrome-satin-finished hinged-type tubular legs and the dining chairs are of bleached walnut, upholstered in fabric of a harmonizing pattern and color.

Flesh-colored mirrors placed on the bulkheads each side of the car add a distinctive appearance to the general attractiveness of the dining room.

In the kitchen and pantry, all exposed metal surfaces are of stainless steel. The refrigerator linings are of stainless steel and special attention has been given to the insulation of the refrigerator with generous use of cork in the walls and between the refrigerator and the outside wall of the car.

The floor in the dining room is of slab cork ½-in. thick laid over Keystone flooring with cork-strip fillers in the channel recesses. Over the cork is a layer of 3/16-in Masonite Presdwood. The deafening floor of copper-

Comfortable Furniture and Deeply Cushioned Carpets Are Features of the Lounge Car



The Kitchen on the Diners — All Exposed Metal Surfaces Are of Stainless Steel

bearing steel is covered with a 1 in. layer of slab cork sealed with odorless asphaltum.

The Lounge Car

The interior of the one lounge car is finished in a somewhat more elaborate manner than the dining cars, following in general the finish of previous lounge cars built for the Katy by A. C. F.

The color scheme is a harmonious combination of blending and contrasting colors with ivory ceiling, two-tone side wall of brown and buff, hand-carved natural-walnut curtain boxes, natural-walnut window capping and green drapes. At the observation end of the car there are large end windows fitted with drapes and curtains to match with and carry out the lines of the side windows. The door at this end is double with glazed and curtained upper panels.

A part of the decorative scheme of the car is a large flesh-colored mirror on the bulkhead etched with a picture of William B. Travis, historically connected with the development of the southwest.

Furniture and deeply cushioned carpets are in selected colors to insure a pleasing and restful appearance, the whole creating a feeling of home comfort.

The furnishings are enriched by light from artistically placed lamps and fixtures. In the ceiling are six bowl-type fixtures with satin chromium finish. Twenty-four recessed fixtures are placed in the lower deck ceiling panels and a like number of pier lights between the windows. Supplementing these fixtures are the table lamps with Pearla Mica shades and satin chromium and black bases.

At the end of the car is a women's lounge and smoking room, a buffet kitchen for serving luncheons and lockers for air-conditioning equipment and electric controls.

The car is equipped with a radio with three speakers located in tables, these speakers being individually controlled at the unit located in the kitchen.

The cars are equipped with Safety Car Heating and Lighting Company's steam ejector type of air conditioning, including a water recovery system. The entire air-conditioning system is automatically controlled for maximum passenger comfort. The refrigeration and air-conditioning units are located above the ceiling accessible through roof hatches and ceiling traps, and the make-up tanks, pumps and control equipment are placed in a locker at the end of the car. The conditioned air is uniformly distributed throughout the car through controlled duct openings leading into perforated deck molding harmonizing with the interior finish of the ceiling. Ducts are insulated with cork sealed with asphalt and covered with wax paper.

Centrifugal exhaust ventilating fans are applied at lounge rooms for smoke removal and in the kitchens for removal of cooking odors.

Current for air conditioning is supplied by Safety 10-kw. axle-generator equipment, the generator being body hung with axis on the center line of the car and

Attractive Furnishings, Heavily Carpeted Rugs and Venetian Blinds Are Features of the Diners

driven by means of combination V-belt and gear drive with a universal shaft connection to the generator.

The cars are equipped with thermostatically controlled Vapor heating system and the fin tube radiation is recessed in the side walls. Water is supplied by the A. C. F. air pressure system with large capacity tanks.

All cars have Johns-Manville acoustical ceiling panels for sound absorption.

The cars are equipped with the New York Air Brake Company's brake equipment Schedule UCB-4-10 with U-12-BD universal valve, including the Simplex unit-cylinder clasp brakes with four 10-in. brake cylinders per car mounted directly on the trucks.

General Dimensions and Weights of M-K-T Cars

	Dining Cars	Lounge Cars	Chair Cars
Length over buffers, coupled, ft. and in.	82– 4⅝	82– 4⅝	81– 0½
Length over end post, ft. and in.	78–10	78–10	72– 6
Width over side sills, ft. and in.	9–10½	9–10½	9–10½
Width, between side posts, ft. and in.	9– 1¼	9– 2½	9– 2½
Truck centers, ft. and in.	59–10	59–10	56– 6
Axle journal size, ft. and in.	5½x10	5½x10	5x 9
Total weight, lb.	181,700	166,800	162,500
Seating capacity	41	43	52

Partial List of Equipment and Materials on the New M-K-T Passenger Cars

Cor-Ten steel	United States Steel Subsidiaries, New York
Stainless steel in diners	Republic Steel Corp., Massillon, Ohio
Plymetl	Haskelite Mfg. Corp., Chicago
Trucks and body castings	General Steel Castings Corp., Eddystone, Pa.
Couplings, yokes	McConway & Torley Co., Pittsburgh, Pa.
Draft gear	Cardwell Westinghouse Co., Chicago
Air brakes	New York Air Brake Co., New York
Hand brakes and draft gear	Universal Draft Gear Attachment Co., Chicago
Center locks	W. H. Miner, Inc., Chicago
Air Conditioning	Safety Car Heating & Lighting Co., New York
Air-conditioning controls for both heating and cooling, including single-tube compensating Thermostats	Vapor Car Heating Co., Chicago
Acoustical ceiling panels	Johns-Manville Sales Corp., New York
Electric wire and conduit	Graybar Electric Co., Inc., New York
V-belts, car lighting	Dayton Rubber Mfg. Co., Dayton, Ohio
Heating system with fin radiation; steam connections between cars, including end valves; flexible metallic conduits and steam couplers; wash-water heating equipment	Vapor Car Heating Co., Chicago
Flooring	Tuco Products Corp., New York
	Goodyear Tire & Rubber Co., Inc., Akron, Ohio
Cork flooring	Armstrong Cork Co., Lancaster, Pa.
Sash	The O. M. Edwards, Inc., Syracuse, N. Y.
Micarta window sills	Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Safety glass	Pittsburgh Plate Glass Co., Pittsburgh, Pa.
	Libbey-Owens-Ford Glass Co., Toledo, Ohio
Curtains	Railway Curtain Company, Chicago
Door check and locks	Yale & Towne Mfg. Co., Philadelphia, Pa.
All furnishings	Marshall Field & Company, Chicago
Coach seats	American Car and Foundry Company, N. Y.
Arm rests	Bakelite Corporation, New York
Water filters	Puro Filter Corp. of America, New York
Lavatories and washbasin equipment	Crane Co., Chicago
Pipe	Byers, A. M. Co., Pittsburgh, Pa.
Hoppers	Duner Co., Chicago
Coal ranges	Stearns Company, Chicago
Paint	E. I. du Pont de Nemours & Co., Inc., Wilmington, Del.
Rubber tiling	United States Rubber Products, Inc., New York

Miller Felpax Lubricator

A NEW type of journal lubricator, designed for use in conventional journal boxes of diners, baggage cars, other passenger-train cars or tenders, has recently been developed and placed on the market by the Miller Felpax Company, Winona, Minn. Road service tests of this lubricator have been conducted during the past 18 months or more with successful results under unusually severe climatic conditions in winter. The lubricator is also said to be well adapted for service on equipment operating through desert country where high temperatures and dust storm conditions are encountered.

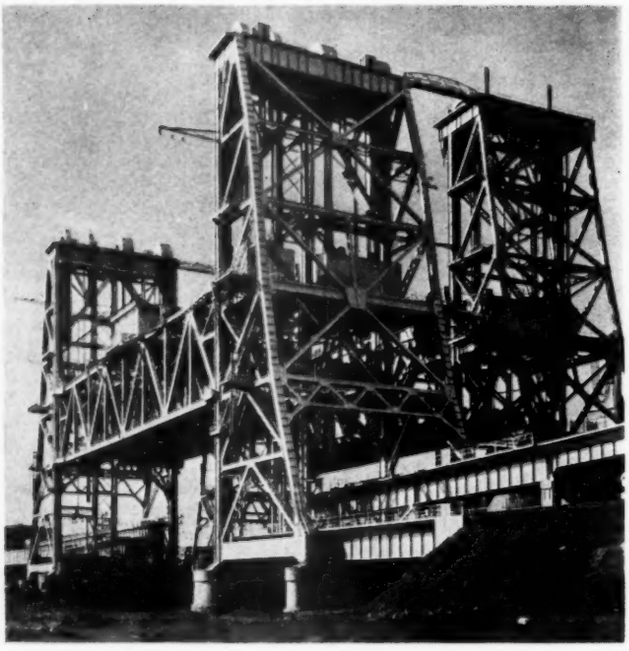
One Section of the New Miller Felpax Lubricator Which Has Been in Service for Over a Year With No Evidence of Glazing

The lubricator is quite simple in construction, consisting, as shown in the illustrations, of multiple wool sections, shaped to fit the underside of the journal against which they are held by spring pressure from the bottom of the journal box. Two small semicircular spring-steel wires, imbedded in each wool section, assure the main-

(*Continued on page 381*)

Miller Felpax Lubricator Applied in a Standard Journal Box

Double-Span Lift Bridge Completes Unusual Six-Track River Crossing



Structure has two long movable spans, one single-track and the other double-track, operating between common towers — Many safeguards protect operation

A General View of the Six-Track Crossing—The New Double-Span Lift Bridge, With Spans Partly Raised, Is in the Foreground

IN conjunction with its extensive and recently completed passenger station improvements at Newark, N. J., the Pennsylvania constructed a six-track crossing of the Passaic river, involving two unusual lift-span bridges with a total of three vertical lift spans. One of the bridges carries three tracks and involves the longest three-track lift span of its type that has been built, while the other, of the same length, has two lift spans, side by side, one carrying two tracks and the other a single track, both operating between common three-track towers. A further unusual feature of the latter structure is the fact that all three tracks are on different grades, ranging up to 2.7 per cent, and are at widely separated levels.

Newark Project Started in 1929

The extensive improvements at Newark, the Pennsylvania's gateway into the Metropolitan area of New York, were begun in 1929 and were carried out in two principal stages in order not to interfere with the intensive passenger train movements at this point. Whereas the old arrangement included an out-moded station with only three tracks, and an old two-track swing-bridge crossing of the Passaic river approximately 1,300 ft. to the east, the new layout includes a modern passenger station just east of the old station location, with eight station tracks and six platforms, several thousand feet of steel and concrete viaducts carrying from one to eight tracks, and the three lift spans carrying six tracks over the Passaic.

The first stage of the work, which included the major part of the new station building, a number of the new elevated station tracks and platforms, and the three-track vertical lift-span bridge over the river, was completed in March, 1935. The facilities provided in this stage were described in two articles which appeared in the *Railway Age* for March 30, and April 6, 1935, the first of the articles dealing largely with the new station facilities, while the second was devoted to the three-track bridge structure. Upon the completion of the entire project in June, 1937, a third article appeared in the *Railway Age* of June 26 of that year, which discussed the project as a whole, but which reserved for later attention a description of the second unusual three-track bridge crossing the river. The present article, therefore, will be confined largely to this second three-track river crossing, which, with the first three-track crossing, now gives the road great flexibility of operation through Newark, with minimum interference from river traffic, where congested conditions existed formerly.

The new river crossing is located directly east of the new station, and approximately 120 ft. north of the old two-track swing bridge which it replaces. The three-track unit of the new crossing, which was erected first, consists essentially of two, three-track tower spans, each 65 ft. long, and a three-track lift span, which is 230 ft. long, center to center of bearings. This structure provides minimum under-clearance of 24 ft. above mean high water, and a clear channel of 200 ft. The vertical travel of the lift span is 111 ft., which provides a full opening of 135 ft. above mean high water.

Three-Track Span is Unusual

While there are many features of interest in this structure, as pointed out in the earlier article referred to, its most unusual feature is the suspension of the

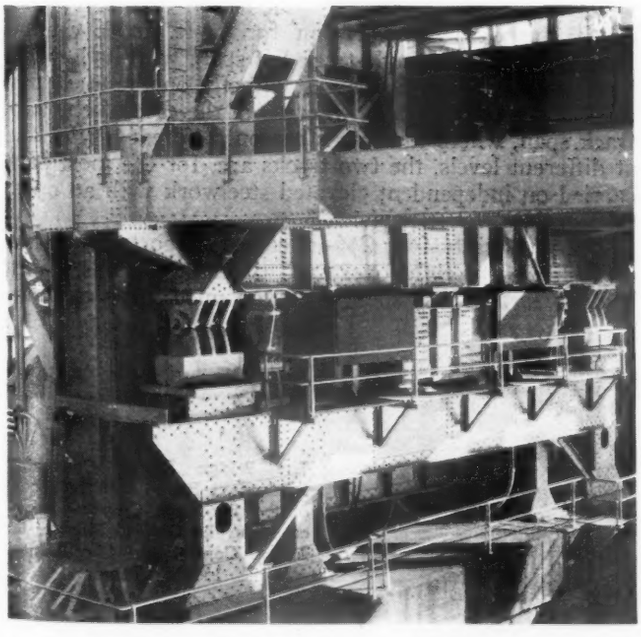
center track of the lift span by hangers from overhead cross trusses extending transversely between the main trusses, an expedient adopted largely to minimize the thickness of the deck. A second interesting feature is the use, to minimize the weight of the lift span, of silicon steel in practically all of the main members of the span, both trusses and floor system, except in the deck, where copper-bearing steel was used to minimize corrosion.

Double-Span Lift Bridge

Immediately following the completion of the first three-track crossing of the river, which in the final arrangement carries Pennsylvania westbound and eastbound trains as already described in previous articles, the second three-track crossing was started. The operating problems faced in the design of this crossing were considerably different from those involved in the first crossing. The first crossing involved the same number of tracks, but these tracks were all at approximately the same level and grade, and were intended to handle much the same class of traffic and equipment. In the case of the second unit, on the other hand, the problem was to provide a two-track crossing for Hudson & Manhattan Rapid Transit multiple-unit trains operating into and from the new Newark station, with minimum interference to this frequent service by river traffic, and, at the same time, to provide a single-track crossing for a second eastbound outlet for Pennsylvania trains destined to Pennsylvania station, New York, and to the road's terminal in Jersey City, N. J. The problem here was complicated by the fact that track arrangements and levels established in connection with the new station at Newark required that the two rapid-transit tracks be at substantially higher levels than the eastbound Pennsylvania track, and on different gradients.

These conditions, in addition to the desire to provide greater clearance beneath the rapid-transit tracks to minimize the number of bridge openings for water movements, dictated the decision to provide two independently-operated lift spans for this crossing—a two-track span for the rapid-transit tracks and a single-track span for the eastbound Pennsylvania track. It then became a question whether to provide entirely independent towers for the two spans, or composite towers to support both spans. Following studies of this problem, the latter arrangement was decided upon, both because of its greater compactness, which was desirable, and because of economies possible in the bridge foundations, and, to some extent, in the superstructure itself.

Looking East From the Passenger Station at Newark Toward the Six-Track River Crossing — The New Double-Span Lift Bridge Is at the Right



Looking Beneath One End of the Deck of the High-Level, Two-Track Lift Span as Seated, Showing the Rocker-Type Bearing Shoes, Air Buffers, and the Metal Housings of the Third-Rail Current Contacts

The new double-span lift bridge with its common towers is located immediately south of the three-track lift span completed earlier, and consists essentially of two-tower spans, each 65 ft. long and 69 ft. wide, and two lift spans, one single-track and one double-track, both 230 ft. long, the same length as the more northerly three-track span. Both the single and double-track spans afford a clear channel width of 200 ft., but whereas the single-track span provides a minimum under-clearance of 24 ft., the same as the three-track span, the double-track span is seated at a higher elevation and provides a minimum under-clearance of 35 ft. Both the single and double-track spans provide full openings of 135 ft. above mean high water, but because of the different span seat levels, this is accomplished with a vertical travel of 111 ft. in the case of the single-track span, whereas the vertical travel in the case of the two-track span is only 100 ft.

Main Piers Have Belled-Out Footings

The double-span lift bridge is supported on four concrete masonry piers, three of which were put down in pneumatic caissons to a depth of approximately 69 ft.

All Three Lift Spans of the River Crossing Are in Full View of the Bridge Control Deck on the Top Floor of "Dock" Tower, Immediately Adjacent

below mean water level, while the fourth, carrying the rear of the east tower span, is supported on timber piles. The caissons employed for the two main piers supporting the forward legs of the lift-span towers were 36 ft. by 98 ft. in plan, while the third caisson was 24 ft. by 87 ft.

The most unusual feature of the caisson piers is the fact that, to spread the loads on their foundations, their bases were belled out on all sides after the cutting edges of the caissons were landed. The belling-out amounted to seven feet in the case of the two larger piers, and to five feet in the case of the smaller pier. The work of belling-out the footings was carried out in a series of operations within each caisson, being confined to one section at a time, while support was given to the sloping roof by a series of H-beams driven on the plane of the roof and breasted-up with timber plank placed either back of the beams or between the beam flanges. As the excavation for each belled section of the footing was completed, concrete was placed, and work was begun in a following section. Another interesting feature in connection with the piers is the fact that, to reduce their weight and to economize on concrete, they were each provided with two large water pockets transversely through them, well below mean low water level.

Unusual Features in Tower Spans

The double-span lift bridge is rectangular in plan, although it crosses the river at a slight angle, and its different spans were designed specifically for the loadings which they carry. Thus, the single-track span was designed for Pennsylvania standard loading, although with a considerably reduced impact factor, since this span is used exclusively by the road's new electric locomotives, with their absence of heavy reciprocating parts, while the two-track span was designed to carry the multiple-unit equipment of the rapid transit service.

The tower spans have two heavy box-section load-supporting columns and two curved rear legs, structurally tied together, and rise to a height of 210 ft. above mean high water at the sheave bearings, or approximately 180 ft. above the lowest track level. Deep solid structural struts connect the tower legs at the base on each side to insure against damage to the towers if by chance they should be struck by boats.

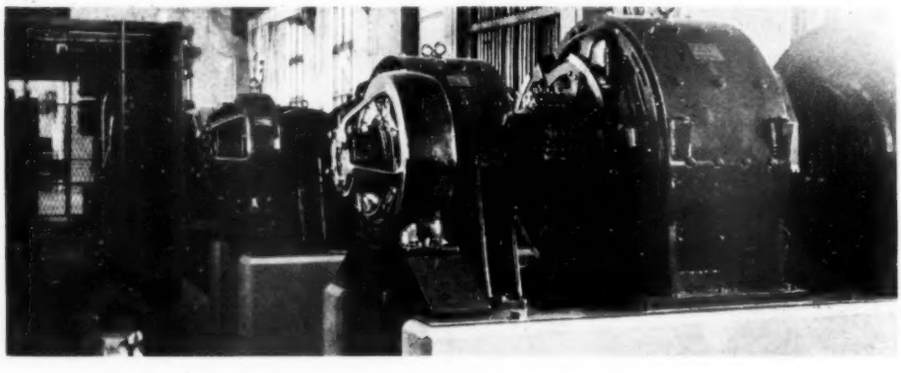
The steel floor system of each tower, for the most part, supports a reinforced concrete deck, which, immediately beyond the ends of the single-track lift span, gives direct support to the track ties without ballast. Beyond the ends of the two-track lift span, on the other hand, with its elevated tracks at different levels, the decks of the tower spans carry independent steel and concrete viaduct structures, which support the lift-span approach tracks at their proper levels. These viaduct structures, which extend east and west from the bridge in accordance with the track arrangement involved in the new station layout, have reinforced concrete, stone-ballasted decks.

Possibly the most unusual feature of the tower spans is the arrangement whereby each supports the operating cables of both lift spans. In this arrangement, the front columns of each tower are connected at the top by a deep truss, the top chord of which carries the sheave bearings and sheaves for the operating cables of both spans.

Details of Spans

Each of the independent lift spans of the bridge is made up of two riveted Warren trusses with parallel chords, and with vertical hanger members at each end. The depth of the trusses of both spans is approximately 40 ft. center to center of chords, but in the case of the single-track span, the trusses are spaced 20 ft. apart, while in the case of the two-track span they are spaced 33 ft. apart, providing room for 13-ft. track centers. In the case of the single-track lift span, with its low and level track, the track ties rest directly on the structural steel of the floor system, whereas in the case of the two-track span, where the tracks are on different grades and at different levels, the two tracks are, for the most part, carried on independent elevated steelwork with an open-type deck.

A total of sixty-four 2⅛-in. cables support the double-track lift span, eight over each of eight sheaves, 15 ft. in diameter. These sheaves are grouped in pairs at the



The Bridge Power Converting Equipment For All of the Spans of the Six-Track Crossing Is Located on the Ground Floor of the Bridge Control and Signal Interlocking Tower

tops of the towers on the upper chords of the load-carrying trusses joining the vertical legs of the towers. Thus, each corner of the double-track span is supported by a group of 16 cables, the outside corner groups extending down alongside tower columns, while the inside groups hang suspended, in the open, between the tower columns. The single-track lift span, on the other hand, is supported by a total of thirty-two 2⅜-in. cables, eight over each of four sheaves, 15-ft. in diameter, at the tops of the towers.

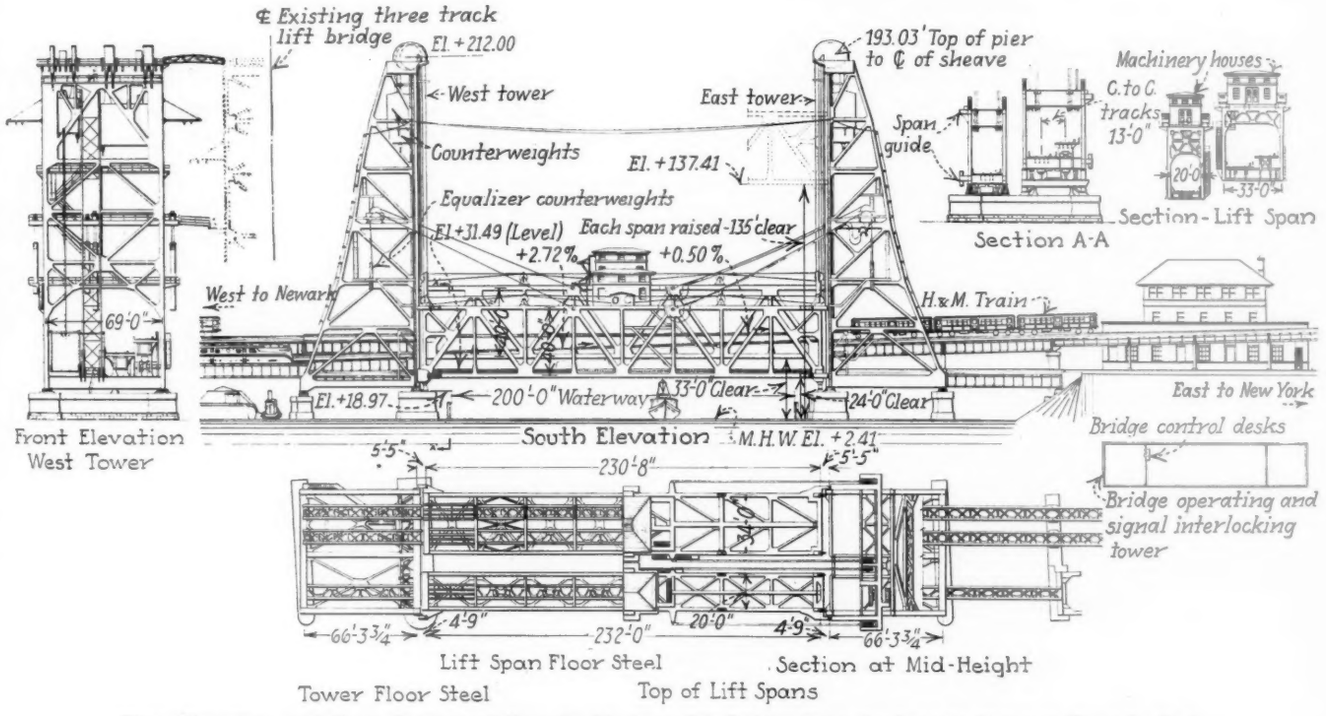
An unusual feature in connection with the operation of both spans is that they are guided only at the outside, or tower column corners. Thus, each span has only four guiding points. However, the guides provided are of the three-way type, which can be adjusted for horizontal movement in any direction. It is interesting to note also that all of the guides are of the wheel type, which do away with the frequent greasing and the inevitable wear which occurs where the ordinary slide-type guides are employed.

Counterweights and Cable Weight Equalizers

All of the span counterweights are of concrete construction in steel-plate enclosures, and the only unusual feature in connection therewith is the fact that to reduce the bulk of those for the single-track span, steel punchings were placed in the concrete to bring about a weight of approximately 210 lb. per cu. ft. It is of interest to note, however, that to overcome the possible development of hydrostatic pressures within the counterweight boxes, and, at the same time to bring about uniform stretch in the cables, the concrete of the counterweights for each span was placed in layers, alternating from one counterweight to the other until both counterweights were completed. All counterweight guides, like those of the spans, are of the wheel type.

The equalizing arrangements on the bridge for compensating for the shifting weight of the main cables as the spans are raised or lowered are similar to that employed on the three-track lift span constructed earlier, except for certain modifications occasioned by the common towers for the two spans. In the case of the three-track lift span, the arrangement consists of four auxiliary counterweights, one on each side of the towers, which are suspended on cables extending over sheaves mounted on the sides of the towers at a height corresponding to the mid-height of upward travel of the upper chords of the lift-span trusses. From these sheaves, the cables extend to the upper chords of the lift-span trusses at their quarter points. Through this arrangement, it is evident that the auxiliary counterweights exert a lifting vertical component on the span when it is at a position less than one-half of its full opening, and a downward vertical component on the span when it is raised above the mid-height of its full opening.

In the case of the double-span lift bridge, the separate equalizing counterweight sheaves for the inner side of both the single and double-track spans are mounted within the tower framework at about mid-height, while the equalizing arrangement sheaves for the outer sides of both spans are fixed to the outer sides of the main columns of the towers in the usual manner. In the case of the double-span bridge also, the equalizing arrangement cables are attached further out on the lift spans, in order to minimize the segments cut by the cables as the spans are moved from rest to maximum height, and thus prevent the inside cables from interfering with the bracing in the front plane of the towers.



Plan, Elevations and Cross Sections of New Double-Span Lift Bridge Over the Passaic River at Newark, N. J.

Among the other interesting features in connection with the double-span bridge, is the fact that all stairs and walkways, which extend to all moving parts, bearings and machinery, are located within the towers instead of on the sides, and, in order to eliminate fire hazard, are constructed of subway grating. Outside of the limits of the track structure on the single-track lift span, the deck is also covered with subway grating, but on the two-track lift span the flooring is of timber plank, used in this case to minimize the danger of shock or short-circuiting occasioned by the third-rail propulsion system em-

Sections of the Viaduct Approaches to the East End of the Double-Span Bridge

ployed for both tracks on this span. All of the steelwork of the bridge was given a field coat of red lead paint on top of its lead shop coat, and two finishing coats of aluminum paint.

Electric Operation and Control

Interesting and unusual as are certain of the design features of the double-span bridge, some of the most interesting features of the structure have to do with its operation, which is controlled remotely and designed to prevent any possibility of power failures or unnecessary delays to train service. As in the case of the three-track lift span bridge built earlier, operation of the double-span lift bridge is controlled in a combined bridge control and signal interlocking tower, a three-story brick structure immediately east of the river. Here, the bridge power converting equipment for all of the spans of the six-track crossing is located on the ground floor level, while the bridge controls for all three lift spans are located at the west end of the third floor, which floor also houses the signal interlocking facilities. The only operating equipment on each of the lift spans of the double-span bridge includes its driving motors with their brakes, and an auxiliary gasolene-engine emergency driving unit, which, in the case of each span, is located in a machinery house on top of the span.

The electrical operating equipment for each of the spans at the river crossing is entirely independent of that for the other spans. In the case of the single-track span, this consists essentially of two 200-hp., 230-volt, d. c., mill-type bridge motors, operated in series, which can be fed from either of two motor-generator sets, one a standby unit located in the operating tower. The double-track lift span, on the other hand, is normally operated by three 135-hp. motors (operated in series) of the same type as employed on the single-track span, which are also fed from either of two motor-generator sets. Ordinarily, the motors on each of the two spans are fed by a single motor-generator set, the second tie-in in each case being to a single spare unit held in reserve for use in emergency.

Four independent sources of power are available for the operation of the bridge—two single-phase and two three-phase; all from railway company sub-stations supplying electric traction current. This power, at 11,000 volts, is brought to a transformer station outside the tower, where it is reduced to 2,300 volts and then fed to the motor-generators. A special feature of the motor-generator sets is the fact that their motors will operate not only on either the 25-cycle, single-phase or three-phase railroad company power supplies, but may also be reconnected to operate on 60-cycle, 3-phase commercial current. This feature greatly simplified and reduced the cost of the electrical installation, and makes it possible to draw upon commercial current available, if that ever becomes necessary or advisable.

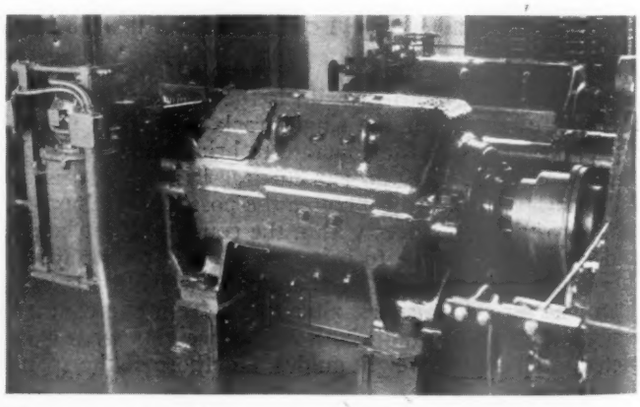
Precise Control of Motors

The choice of power to be used at any time is determined by the power supply conditions at the time, and the power used in any case is converted by the motor-generator sets into 550-volt, d. c. current for operating the span motors. Throughout the system, the speed of the span-operating motors, and thereby the rate of travel of the lift spans in either direction, is controlled with a large degree of uniformity and accuracy by varying the strength of the field in the generators supplying the motors. The operating motors on both the single and double-track lift spans are capable of bringing about full opening of the spans within a period of 85 seconds, the same speed which can be attained in the case of the three-track lift span constructed earlier. This involves a maximum speed of two feet a second during the main length of travel up the towers.

In order to insure the greatest safety of operation of the spans, each of the bridge motors is equipped with an electrically-driven, oil plunger-type brake, and, in addition, a similar floor-mounted brake is provided in each machinery house. These brakes, which can be released only when power is applied to the bridge motors, take hold automatically when the motors are de-energized, and thereby insure that the spans will be held secure on their seats, or at any point stopped within the limits of their travel. A further feature of these brakes is the arrangement whereby they take hold in succession, rather than simultaneously, and thus prevent any severe shocks to the bridge or the operating machinery, which might result from sudden stops of the spans.

Span Movements Carefully Safeguarded

The movements of both lift spans of the bridge, as in the case of the three-track lift span of the adjacent bridge, are controlled by five-point controllers, and, to guard against overrun of the spans when being raised, and the possibility of shock in seating them, the travel of each span is governed by limit switches. Furthermore, the speed of operation of the spans is cut down automatically as they reach their upper or lower limits of travel. Specifically, from their positions of rest on



Within the Machinery House of the Double-Track Lift Span, Showing Two of the Operating Motors and Their Electrically-Operated Oil Plunger-Type Brakes

their shoes, the spans can be raised at full speed until they reach Elevation 118, at which point they slow down automatically to first-point speed and continue at this speed to Elevation 125. At this elevation, a warning light flashes on the bridge operator's desk, and at Elevation 126, the spans stop automatically.

If the operator desires to raise either of the spans higher, he must return his controller to neutral, whereupon he can again regain his power. Then, by pressing a release button, he can continue to raise the span at first, second or third-point speed up to Elevation 134, at which point the main counterweights come in contact with air buffers located on fixed columns near the bottoms of the towers. At Elevation 135, power to the spans is cut off and the brakes are applied. As an additional safety factor, an additional safety switch is provided at Elevation 136 ft. 3 in., which is tripped by one of the counterweights in the event of the failure of the main limit switch.

In similar manner, the movement of both spans downward is regulated and controlled automatically so that it is impossible to seat them with any appreciable shock. Directly upon seating either of the spans, power remains on its driving motors for approximately six seconds, which overcomes any tendency for the span to rebound. The power then cuts out automatically.

In case of a complete electrical power failure, both of the spans can be operated as required by means of the gasolene-engine driving units provided on the spans. In the case of the two-track span, the unit is a 6-cylinder, 180-hp. marine-type engine, while a 6-cylinder, 115-hp. engine of the same type is provided for emergency operation of the single-track span.

The span and rail locks on both spans are of the electro-pneumatic plunger type, and, as in the case of the similar locks on the three-track span, are fully interlocked with the bridge control mechanisms and the signals and smash boards governing train operation. In this arrangement, each movable span must be seated properly, with both its span and rail locks in position, before the signals can be cleared for train movement over them. Furthermore, the power to the bridge motors must be cut off and the clutch of the emergency gas-engine drive of the span under consideration must be locked in neutral position. Before the bridge operator can secure power to raise either of the spans, the track signals in connection with the particular span to be raised must be set at stop, the governing smash boards lowered, the span and rail locks withdrawn, and the master lever of the interlocking machine set at normal. Furthermore, all track circuits must be unoccupied between the smash boards involved. All of these conditions are indicated electrically on the bridge control desk in the tower.

Spans Erected as Cantilevers

The use of inclined legs, as in the earlier three-track lift span, could not be followed in erecting the spans of the double-span bridge since this type of falsework would have encroached upon the new 200-ft. clear river channel. The spans were, therefore, erected as true cantilevers, using the counterweight guides for support of the inside trusses of both spans.

Both spans were erected in their fully raised position, the two-track span being erected first, followed by the single-track unit. During the erection of the two-track span, the horizontal bracing systems in the towers were augmented by additional members to take care of the torsional stresses prevailing.

The double-span lift bridge described in this article was designed and erected under the general direction of W. D. Wiggins, chief engineer of the Pennsylvania Railroad, A. C. Watson, chief engineer, New York zone, and L. P. Struble, engineer—Newark improvements, and under the immediate direction of T. W. Pinard, engineer of bridges and buildings, New York zone. Waddell & Hardesty were consulting engineers on the superstructure design. The substructure was constructed by Senior & Palmer, New York, under sub-contract with J. Rich Steers, Inc., New York, and the superstructure steel was fabricated and erected by the Mt. Vernon Bridge Company, Mt. Vernon, Ohio. The bridge electrical operating and controle quipment was furnished by the General Electric Company and was installed by the Beach Electric Company, Newark, under the general direction of H. C. Griffith, electrical engineer of the Pennsylvania. The interlocking arrangement between the track signals and the bridge control equipment was handled by company signal forces, under the direction of J. S. Gensheimer, superintendent of telegraph and signals, New York zone.

Miller Felpax Lubricator

(*Continued from page 375*)

tenance of full contact with the underside of the journal. The sections are interlocked in a simple manner and bolted to the front of the journal box, as illustrated, to prevent shifting. A U-iron, fitting between two of the sections, further prevents rotative movement. The lubricator sections are made of high-grade virgin wool so shaped that the end fibers are in contact with the journal, thus tending to prevent glazing and providing maximum capillary action. Four lubricator sections are required on 5-in. by 9-in. journals and five on all larger sizes up to 6½ in. by 12 in.

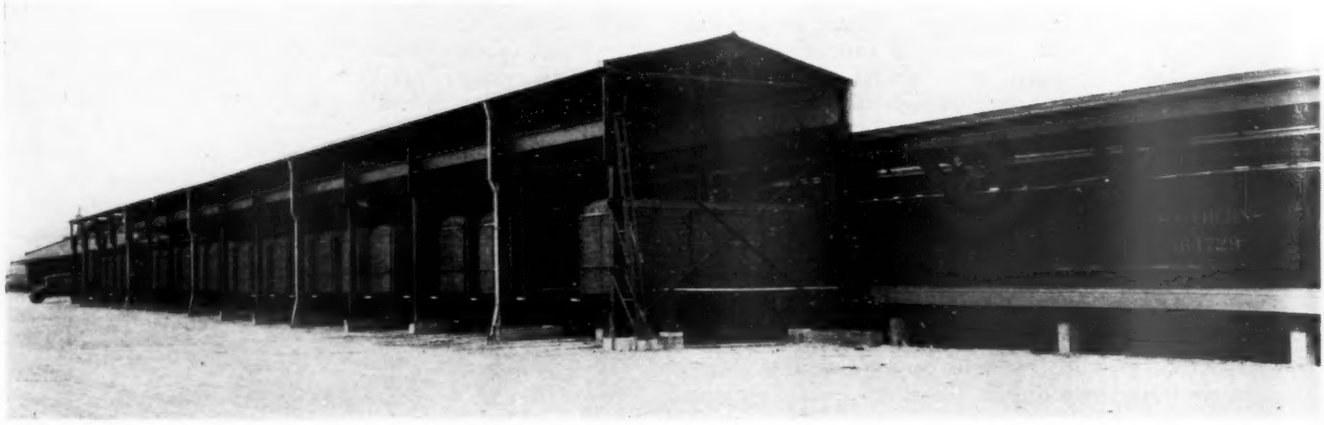
The Miller Felpax lubricator can be easily applied to or removed from any standard journal box without jacking. No special tools or skilled help are required in the application, which cannot be made incorrectly. Ordinary car oil is used as a lubricant, being applied in the journal box to a maximum depth of about 1 in. Experience in the road service tests mentioned indicate that the lubricator operates without glazing or noticeable wear and with a journal temperature appreciably lower than with waste-packed boxes.

The lubricator need not be removed for examination except at the time of wheel change. Rebrassing is done without touching the lubricator. If desired, the lubricator can be removed sectionally in a few minutes. Repacking during the winter due to soggy packing is eliminated.

In routine wintertime servicing, snow at the lid of the journal box is removed in the usual manner. Some snow and ice remaining in the bottom of the journal box, however, is said not to affect the lubricator. A small amount of car oil is added to the box about once weekly, for the best results. It is said that tests conducted last winter showed no need for additional servicing of passenger-car journals equipped with this lubricator, even in the case of 36-hour lay-overs with the thermometer at numerous times registering 20 deg. below zero.

SINCE THE END OF 1936, 300 route miles of main-line electrification projects have been authorized, completed or undertaken by the four British roads. At the close of that year, out of a total of 19,218 route miles, 612 had been electrified. The major project now in progress is that undertaken by the London & North Eastern on its line between Manchester and Sheffield.

Motor Transport Section



Overhead Crane Installation at the Court Street Station of the Pennsylvania

Hauling Cincinnati's Merchandise

All l. c. l. traffic interchanged between many stations is transferred by truck in demountable body

DESPITE the fact that the system of interchanging l. c. l. freight between stations within the terminal area by means of demountable bodies handled on highway trucks has been in successful operation for nearly 20 years in Cincinnati, this terminal remains unique in this respect. This operation is one of the first rail-highway co-ordinations, having been started in 1919, long before highway competition became a factor in influencing the railways to enter the highway field on their own account.

This particular co-ordination was inaugurated because of special conditions existing in the Cincinnati terminal, and it has solved these peculiar problems successfully ever since its inception. All l. c. l. transferred in Cincinnati, with the exception of a very few unwieldy shipments, is handled in demountable bodies by the trucks of the Motor Terminals, successor to the Cincinnati Motor Terminals Company, an independent organization that has worked closely with the railways since its inception. Originally, the Motor Terminals Company, a Delaware corporation, owned the entire capital stock issue of the Cincinnati Motor Terminals Company. The former was an engineering, research, development and financing company, and the latter strictly a local operating company. About a year ago, to conform with certain new legislation, these two companies were consolidated as Motor Terminals, Inc., an Ohio company.

Terminal Problems

The Cincinnati terminal is an important interchange point between the northern and southern lines. It comprises the scattered and frequently hilly industrial and business sections of Cincinnati proper, as well as similar sections immediately across the Ohio river in such Kentucky cities as Covington and Newport, including several smaller centers, with a combined population of over 250,000 inhabitants.

Many separate freight stations are scattered about this area, some of which have only roundabout rail connections, while others are reached by relatively heavy grades, and still others are from 10 to 15 miles distant from each other, often requiring a haul across the long and busy Ohio river railroad bridges. A further contributing factor was the fact that several of the connections between railroads in Cincinnati are in the middle of the busy streets in the wholesale and commission house sections. These streets always presented a problem, even in the days of horses and drays, and the situation was aggravated by the use of motor trucks by these business houses, which had to park on the tracks in some instances for loading and unloading.

To relieve this situation, the city council passed an ordinance prohibiting switching on these tracks except during certain hours of the night. This may have been desirable from a civic standpoint, but it played havoc with the merchandise schedules on traffic that had to be interchanged between the railways. Accordingly, the Cincinnati Motor Terminals was formed to handle this entire movement with motor trucks which were not confined to certain streets and could work out the most desirable routes between the stations, saving much mileage, time and a large number of switch-engine hours. In addition, with the flexibility of operation provided by

the trucks, the merchandise schedules could not only be maintained, but improved in many cases.

Starting with a fleet of 14 trucks and 200 containers in 1919, the Motor Terminals now operates 20 trucks, 5 tractors and 20 trailers, and 250 containers in this interchange service.

Method of Operation

The manner in which these containers are used was described in detail in the *Railway Age* of December 22, 1934, and, with a few minor changes, this system is still in effect. Each station has a system of cranes, adapted to the design and space available in that building. The empty containers, which are really demountable truck bodies, are spotted in strategic places to cut down hand trucking on the freight house platforms, and, when loaded, are picked up by the cranes and dropped on to the special chassis with which each truck is equipped. This operation, including the fastening, is so simple as to require considerably less than five minutes on the average from the time the truck body is picked up from the platform by the crane to the time when the highway truck drives off with it.

Among the other advantages of this system of l. c. l. freight transfer is the lack of damage that ensues. In nearly 20 years of operation, handling tonnage which has amounted to 255,000 tons in peak years, the Motor Terminals has paid an average of only $3.64 in damage claims *per year*.

In addition, the accounting is extremely simple. Between downtown stations, a flat charge of $1 per ton is assessed, with $1.50 per ton between outlying stations. Figures are not available as to the switching cost per ton by rail, but there is no question that this figure would be materially higher than the present cost.

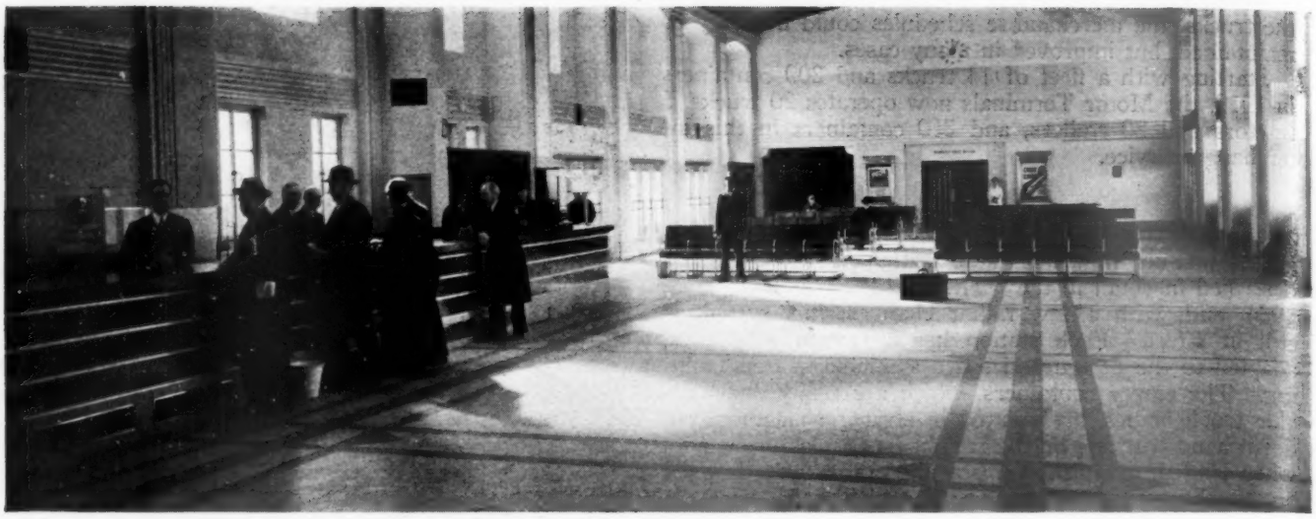
Pick-Up and Delivery Service

The Motor Terminals possesses highway equipment, an efficient garage and workshop and a personnel experienced in operating trucks in Cincinnati's streets. Accordingly, as soon as the first tentative experiments in collection and delivery service were made by the railroads some years ago, an agency for handling this service was already available. Starting with a fleet of 7 trucks used exclusively in collection and delivery service in 1934, the Motor Terminals now has 41 trucks engaged in such service.

How the Truck Bodies Are Loaded on the Platform

The method of dispatching the trucks used in interchange service has been applied successfully to the collection and delivery fleet. A record of each trip is always before the dispatcher in the central office, in a form not unlike a train report. The drivers telephone in for orders periodically, and since the dispatcher has available a complete list of the work to be done, he is able to dispatch the entire fleet throughout the city with a minimum of delay and of empty movements. Also, at the close of each day's business, the dispatcher's reports and the shop and garage reports supply the superintendent with a clear picture of the day's operations, which is supplemented, of course, by daily visits of inspection.

Shifting Loaded Truck Bodies By Means of Overhead Cranes



The Spacious Waiting Room Is Equipped and Decorated in Modern Style

Train-Connection Buses Operate Across Bay Bridge

Atchison, Topeka & Santa Fe opens new coach station in downtown San Francisco

AS the latest step in the improvement in its passenger service into San Francisco, the Atchison, Topeka & Santa Fe began the operation of train connection buses into a new downtown station on January 1. Under the new arrangement, passengers leave the trains in Oakland and are taken across the San Francisco-Oakland Bay bridge in buses to the new Santa Fe bus terminal on Fourth street near Market in the heart of San Francisco.

Culmination Of Improvement

This step marks the culmination of a progressive improvement of Santa Fe passenger service into San Francisco. Originally, and for many years, the trains of the Santa Fe operated to Richmond, Cal., on the east shore of San Francisco bay, from which point the road operated its own ferry service across the bay to San Francisco. However, since Richmond is some eight miles north of San Francisco, this not only involved excess train mileage, but also a long trip by ferry over water that was not infrequently rough, and subject in certain seasons to heavy fogs which sometimes caused serious delays.

Some years ago, the Santa Fe improved this service by entering into an arrangement with the Southern Pacific whereby Santa Fe trains operated into Oakland and thence to Oakland Mole over S. P. tracks, and passengers

The Train Connection Bus Fleet Is Modern and Attractive

were handled across the bay via S. P. ferries. Since Oakland is directly opposite San Francisco, this shortened both the rail and ferry distance materially and afforded greater convenience to passengers.

Greater Convenience

The new train connection arrangement not only further shortens the time materially and affords the passengers greater convenience, but also gives the railroad the advantage of handling its passengers into and out of San Francisco in its own vehicles. Under the new operations, the trains will pull into San Pablo Avenue station at Oakland, where the passengers will transfer to motor coaches. This Santa Fe station had not been used for through passengers for some time, but it was rehabilitated for the purpose and a roadway was built alongside the tracks so that the buses may draw up beside the trains and the passengers may transfer without inconvenience. Porters will ride the buses between Oakland and the San Francisco station to take care of hand luggage.

The San Pablo Avenue station is situated only a few hundred feet from one of the east approaches to the bridge, so that there is practically no traffic interference on the Oakland side. The bus terminal on Fourth street is likewise only a block or two from the west approach, so that there is little traffic interference in San Francisco. In addition, the bus terminal is much nearer the center of the city than the Ferry building to and from which passengers were formerly handled. In all, the new operation will save a passenger 30 min. per trip as compared with the former method.

One of the Fleet of Train Connection Trucks Used for Mail, Express and Baggage

New Terminal

The Fourth street terminal is situated only 160 ft. from Market street, San Francisco's main traffic artery. The new steel and concrete structure, which cost approximately $500,000, consists of one story and a mezzanine and is ultra-modern in design. The exterior is finished in yellow tile, with a blue tile border. The ground floor occupies 29,000 sq. ft. and contains the usual public facilities; the mezzanine is reserved for offices. In addition to the train connection operation, the new building will

The New Station in San Francisco Is Attractive Architecturally and Centrally Located

serve as a general terminal. Among the companies now negotiating for joint use of the terminal are the Santa Fe Trail Stages, the Burlington Transportation Company, the San Francisco & Napa Valley, the Sacramento Northern, the Key Route and others.

Equipment

In preparation for this service, the Santa Fe acquired a fleet of modern coaches representing the latest development in design and construction. This fleet will operate in shuttle service between the San Francisco and Oakland terminals. If the application now pending before the California Railroad Commission to operate streamline train-bus service between Los Angeles and San Francisco is approved, this fleet will be considerably augmented. A fleet of trucks has also been purchased for handling mail, express and baggage between San Francisco and Oakland in connection with the new service.

Seasonal Operations Successful

Union Pacific serves several national parks with motor transport and hotel system

BETWEEN June 1 and the third week in September of each year, the Union Pacific, by means of its motor transport and hotel system, supplies tourists with a comfortable means of seeing the outstanding attractions of Zion, Bryce Canyon and Grand Canyon national parks; the Cedar Breaks national monument, and the Kaibab national forest. This service, penetrating the largest area in the country that is without railways, gives access to a large and interesting territory in southwestern Utah and northwestern Arizona, the U. P. coaches operating over some 453 miles of highway regularly, as well as offering numerous side trips.

A wide variety of motor coach tours is provided. Much of the business comes from transcontinental rail passengers, who break their journey at Lund, Utah, on the main line of the U. P. between Salt Lake City and Los Angeles, and go to Cedar City via a branch line. Combination rates are offered on transcontinental tickets for this purpose, and an intensive sales campaign is conducted at U. P. ticket offices throughout the country to sell the tours. As an additional inducement, passengers for northern California or the Pacific Northwest are given low round-trip rates between Salt Lake City and Cedar City, to enable them to take advantage of the tours. The motor transport system and the lodges and hotels are operated under the direct control of the president of the U. P. who is also president of the Utah Parks Company.

The principal tours offered consist of two one-day tours, one two-day tour, one four-day tour, and one six-day tour; as well as three one-way tours over different routes between Cedar City and the north rim of the Grand Canyon for persons desiring to cross to the south rim and continue their journey from there. All of these tours are on an all-expense basis. One of the one-day tours is to Cedar Breaks national monument, a round-trip of 48 miles, the other to Zion national park, a round-trip of 114 miles. The two-day tour includes Cedar Breaks and Bryce Canyon national park, a round-trip of 158 miles. The four-day tour goes to Cedar Breaks, Bryce Canyon and Zion, a round-trip of 274 miles. The six-day tour includes all points of the four-day tour and a Grand Canyon tour in addition, a round-trip of 489 miles. The three one-way tours between Cedar City and the north rim of the Grand Canyon follow different routes, all covering distances of between 225 and 250 miles. The all-expense costs of these tours range from $9.75 to $58.75.

In addition, at Bryce Canyon, Zion and Grand Canyon national parks, the U. P. operates several side tours requiring from one to five or six hours duration. The service also provides all-expense camping trips at Grand Canyon national park, including guides, horses, pack-animals, meals and sleeping equipment. Special six-passenger sedans may also be chartered from the U. P. by those desiring this service.

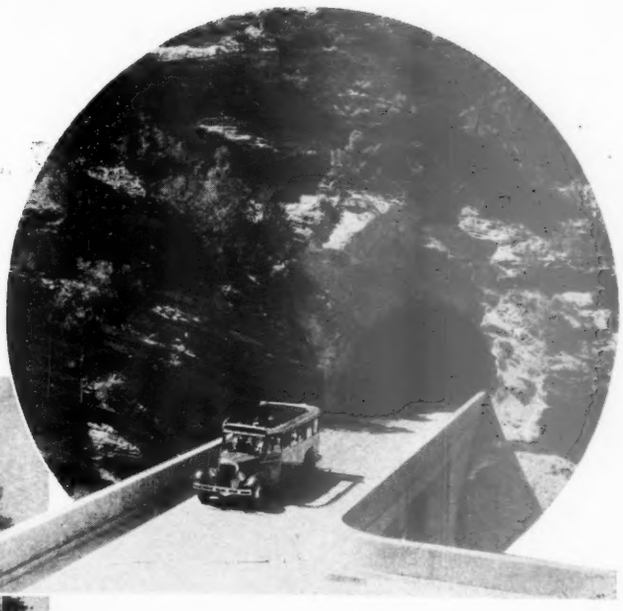
Equipment and Personnel

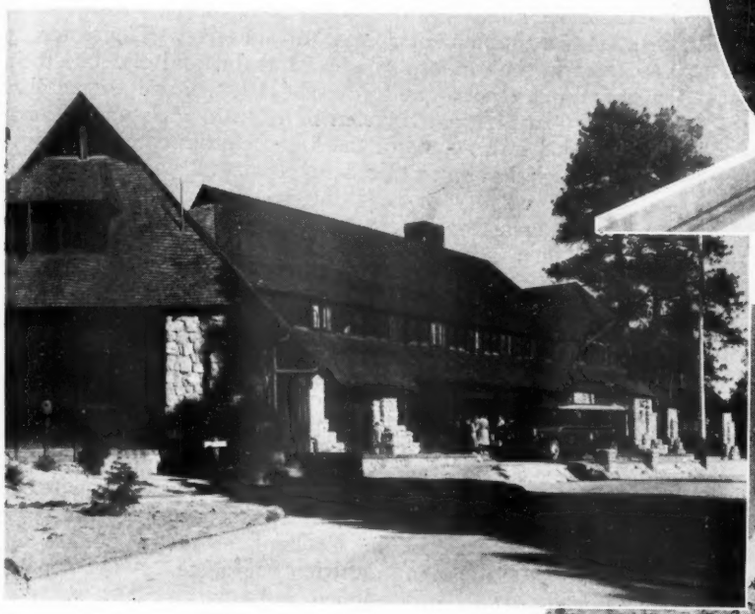
Modern 14- and 18-passenger buses are standard for this service, and, as stated, sedans are available upon payment of the extra charge therefor. In addition, a fleet of trucks is maintained for hauling supplies to the territory. The buses and trucks are kept in garages and shops during the winter season, except those used in purely local service. Adequate facilities for running repairs are available but all major repairs are made during the off-season and the coaches are in such shape at the beginning of each season that they go through the season without major repairs, barring accidents.

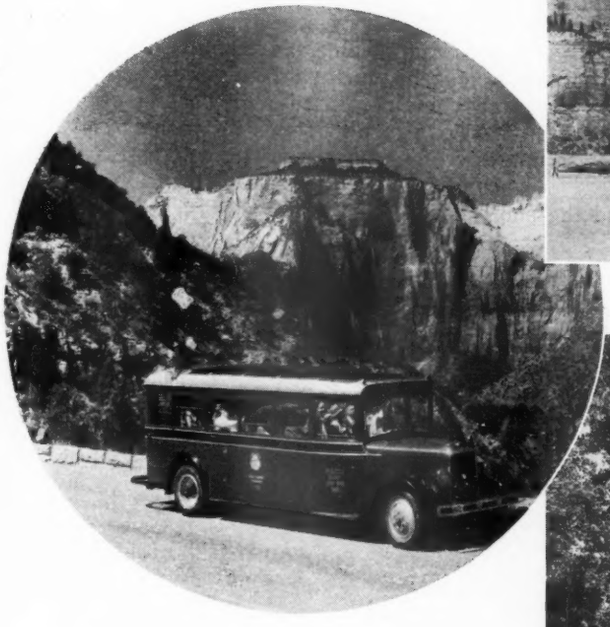
The safety record, despite the rough terrain traversed, is excellent. The attractions of this part of the country in the summer are so outstanding that the U. P. has practically no personnel problem except to pick and choose from among the numerous applicants. Since the season co-incides with college vacations, a large proportion of the drivers and hotel employees are recruited from students of the University of Utah, Brigham Young University and Utah Agricultural College.

All of the hotels operated by the U. P. in this area are striking from an architectural standpoint, blending with the unusual scenery in which they are situated. These establishments include the El Escalante Hotel at Cedar City, Utah, the starting point of the tours, Cedar Breaks Lodge, Zion Lodge, Bryce Canyon Lodge and the recently constructed Grand Canyon Lodge, and Kanab Lodge, the latter being for restaurant purposes only. Cafeterias and housekeeping cabins are also operated for the benefit of tourists driving their own cars. De luxe guest lodges, containing two rooms, each with accommodations for from one to three persons, are a part of the accommodations at Zion, Grand Canyon and Bryce Canyon lodges.

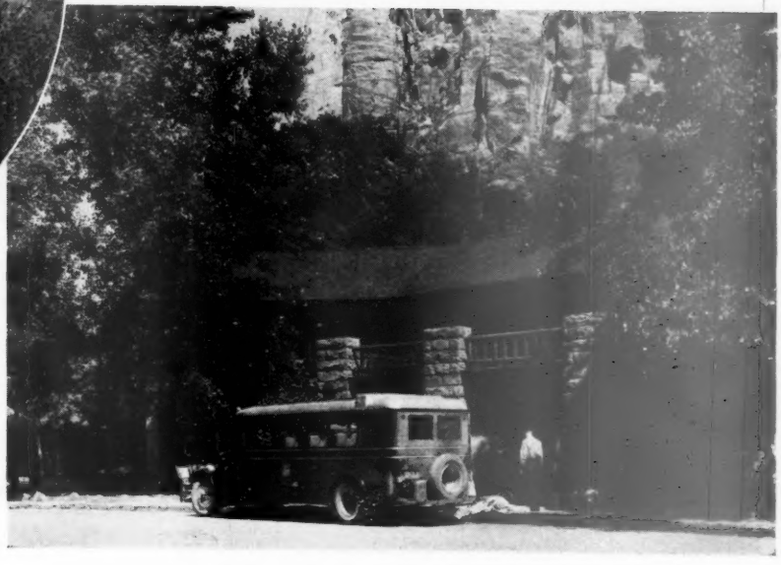
Striking Scenic Attractions Feature the U. P. Utah Bus Operations







U. P. Lodges and Cabins Are Scattered Throughout the Various Parks



Colorado Ski Buses

THE railroad owned Denver-Salt Lake Pacific Trailways is experiencing a successful season in the operation of ski buses out of Denver. This operation, which was started in an experimental way last winter, has blossomed into a profitable undertaking this year. It is also being sponsored by a number of Denver stores dealing in ski outfits, and by the Junior Chamber of Commerce of Denver, and is supported by a comprehensive advertising campaign.

A Group of Enthusiastic Ski-Bus Passengers

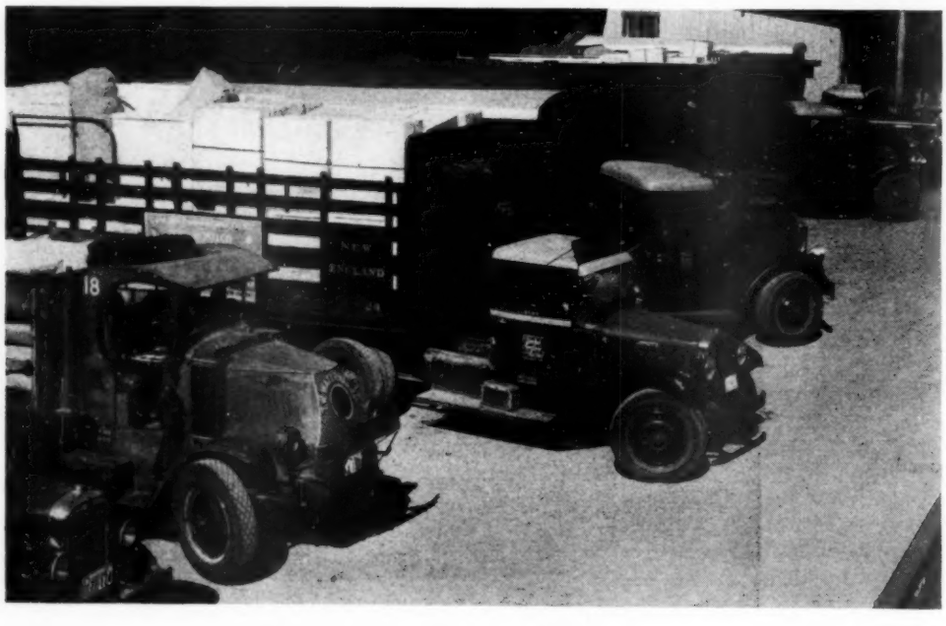
Maine Central Purchase

SUBJECT to the approval of various commissions, the Maine Central Transportation Company, a wholly-owned subsidiary of the Maine Central, will purchase the Maine & New Hampshire Stages. These lines operate regularly between Portland, Me., and South Paris, and between Lewiston, Me., and Welchville. During the summer resort season, the service is extended to Beecher Falls, Vt.

Moving Factories and Farms

BY the use of rail-highway co-ordination and special types of containers, the English railways have again become an important factor in the moving business. A number of interesting farm and factory removals have occurred in the past few months. A farm, including 100 cows, 400 other animals and 20 tons of farm implements, was moved from Towcester to Newark, 114 miles, by special train, and the livestock, farm implements and household furniture of another farm near Ipswich traveled by train to Helston in Cornwall, 304 miles—one of the longest cross-country removals which have recently been arranged. Another farm removal was from Leighton to Tonbridge, 181 miles, this transport task involving 75 cattle, two bulls, two horses, a considerable number of chickens and 13 tons of implements, such as elevators, binders, a tractor, haymaking equipment, etc., as well as two railway containers of household furniture. Two London factories have also been moved some 35 miles each, comprising 44 tons of machinery, 60 tons of stores and 14 tons of office furniture, as well as the furniture and personal effects of 50 members of the staff, which were carried with the help of 135 containers. More than a door-to-door service was arranged, the railway staffs removing the machinery from its place in London and transferring it to the exact position required in the Cheltenham factory ready for assembly by the manufacturing engineers. All four main line railways have developed and enlarged their removal organizations and during the past three years the number of railway household removals has more than doubled. The introduction of specialized rail containers is proving of increasing value, an example of the transit of foodstuffs by this method being the conveyance of eggs in a rail container fitted with shelves from Bude to Brighton. As a result of this test consignment covering a journey of more than 200 miles, 500 cartons of eggs are being despatched weekly between Cornwall and the south coast.

* * * *



Fast Train Service, Coupled with Truck Flexibility, Are Bringing Merchandise Back to the Rails

NEWS

Mo. P. Hosp. Assn. Attacked by M.D.'s

Seek legal handicap to co-operative medical care of railroad employees

The question whether the Missouri Pacific Hospital Association is not and cannot be entitled to a charter under Missouri law has been raised by the St. Louis Medical Society and the St. Louis Dental Society. In January these organizations asked Attorney General Roy McKittrick of Missouri to lend his name for use in a quo warranto proceeding which would establish the facts, this procedure being taken because, under Missouri law, the name of the attorney-general is essential in the prosecution of quo warranto proceedings. Spokesmen for the Missouri Pacific Hospital Association asked General McKittrick for a hearing at which they might be permitted, in substance, to show cause why his name should not be used in the contemplated action. The hearing was conducted in Jefferson City on January 31, and the case was taken under advisement by the attorney-general.

At the hearing counsel for the petitioning medical and dental groups claimed that the Missouri Pacific Hospital Association is not and cannot be entitled to a charter under the Missouri law which permits and directs that a corporation, to organize without capital stock, must qualify as either "benevolent, religious, scientific or educational." They contended that the association is a business organization. Another allegation put forward by the petitioners was that a corporation cannot practice any of the learned professions.

Charles M. Hay, counsel for the Missouri Pacific Hospital Association, contended the association is properly incorporated, that the association is benevolent and that hospitals have been incorporated under law for over a half-century. A corporate hospital, he argued, has the right to furnish medical care and attention.

"Stripped of all pretense and camouflage, what these gentlemen want the attorney-general to do is to help them destroy what they call the 'contract' practice of medicine," he continued. "They want to deny the right to every hospital and every group to engage doctors by the month or year, and force every patient to call in his own doctor at his own expense."

Last October the Missouri Pacific Hospital Association rounded out a quarter-century of health service. On its payroll are 670 physicians and surgeons. It has 345 points at which physician representatives may be found. The association maintains 288 local dispensary points. It owns outright two hospitals, one at St. Louis, and the other at Little Rock, and has a working agreement for hospitalization of its members in St. Mary's hospital at Kansas City. There are 54 other points at which patients may be hospitalized. During the period from 1920 to 1936, the association hospitalized 100,000 patients, with more than 1,300,000 hospital days, and in addition, handled 2,000,000 "out" patients. Approximately 2,150,000 prescriptions for drugs and medicines were filled. In 1936, its assets included investments of $1,951,399, with ownership of the two hospitals accounting for $1,860,606 of this figure.

Health benefits offered by the association include hospitalization and treatment of employees for all ailments (social diseases excepted); dental work for diseased or injured conditions of teeth (bridges, crowns and plates excepted); drugs and medicines on written prescription of an association physician; the supplying of artificial eyes, trusses, bandages and crutches; care of tuberculosis sufferers at designated hospitals or sanatoriums; ambulance service when necessary; and surgical care at cost for wives and minor dependents.

Membership dues, automatically deducted by the management from payrolls, are based on monthly wages. Health service was begun in 1876 by the management of the railroad and continued under control of the railroad until 1912, when the company authorized the establishment of a board of managers consisting of four members appointed by the management. Re-organization of the association with changes in its constitution and by-laws predicated on the information and experience gained since 1912, was effected on October 5, 1920.

Electric Locomotives for Manchester-Sheffield Electrification

The London & North Eastern (Great Britain) has recently ordered 70 electric locomotives for use on the Manchester-Sheffield-Wath section, which is now being electrified. The locomotives are equipped for collecting 1,000-volt d.c. power from an overhead contact system. Each unit weighs approximately 80 tons and develops 1,850 hp. Each has been designed to meet all traffic requirements in both passenger and freight service, with the exception of limited passenger trains, for which a small number of express locomotives will be acquired.

Says Pennsy Gave Aid to Shippers

Wheeler charges that road lost $1,500,000 by endorsing bank loans

Senator Wheeler's committee investigating railroad finance, on February 18, learned that between 1927 and 1931 the Pennsylvania lost $1,500,000 by guaranteeing bank loans to shippers of fruits and vegetables. This information was given to the committee by Julien L. Eysmans, vice president and assistant to the president and A. J. County, vice president in charge of finance and corporate relations of the Pennsylvania, who occupied the witness stand. These witnesses told the committee that they had used railroad subsidiaries to guarantee the loans because of the fact that the Pennsylvania was engaged in a highly competitive race with other lines which were doing the same thing.

Senator Wheeler contended that the officials had violated the "spirit and letter of the law" in making these loans. Both witnesses denied that this was the case and went on to explain that they had abandoned the practice because it "did not work out." Later in the hearing, Senator Wheeler accused Mr. County of loaning money of the Pennsylvania Company to cooperative fruit associations in the South without consulting the Interstate Commerce Commission or his own lawyers as to the legality of the transaction. He went on to say that he believed that the guaranteeing of loans by railroads to shippers is "in the nature of a rebate." "While you don't indulge in old-fashioned rebates," he said, "yet what you are actually doing is the same thing."

Mr. Eysmans said that the railroad believed it better to give financial aid to fruit and vegetable growers in "bad years" than to permit the industry to entirely collapse with a resultant loss in revenue to the carrier. Answering a question of Senator Wheeler's, Mr. Eysmans said that he thought the law should be so amended as to prohibit wholly-owned subsidiaries from loaning money to shippers organizations without approval of the Interstate Commerce Commission. Asked what the present policy of the Pennsylvania was regarding loans to shippers, he said that they were "out the window." According to Mr. Eysmans, "None of these people was very appreciative" with the result that

(*Continued on page 397*)

Planning for R. R.'s A Major D.C. Sport

"One big railroad," a new court for bankrupts among the ideas incubated

Another "plan" for the solution of the railroad problem—the single-corporation idea—was publicized during the latter part of last week as being under consideration in Interstate Commerce Commission councils, where, the report said, it had won the support of at least two commissioners. Earlier in the week, as reported in the *Railway Age* of February 19, similar publicity was accorded the "transportation board" idea, which would contemplate a tribunal with functions similar to those of the former Federal Co-ordinator of Transportation.

Thus go the latest speculations on Interstate Commerce Commission preparations for the forthcoming White House railway meetings at which Chairman Splawn and Commissioners Eastman and Mahaffie will be among the conferees. Also, it has been suggested that the Ex Parte 123 decision might become a platform for a discussion of the commission's views with respect to a permanent solution of the railroad problem. In this connection, however, it is believed that such a course might unduly delay the decision which the commission is understood to be desirous of issuing at the earliest possible date.

Furthermore the pressure of work on the rate case has undoubtedly been such as to preclude the giving of much conference time to any formal consideration of long-range plans; and thus anything being done at this time in the latter connection has perhaps been limited to informal exchanges of ideas of individual commissioners. In any event, as pointed out in last week's issue, Chairman Splawn, who sent out the invitations for the White House meeting, has denied that any information coming from him could have been the basis for reports stating that the "transportation board" plan was being drafted by a committee of which he was chairman.

The single-corporation idea, heralded as the Miller-Caskie plan, was advanced by Commissioner Miller in more or less academic fashion in an address delivered August 31, 1937, at a Salt Lake City, Utah, meeting of the National Association of Railroad and Utilities Commissioners; but Commissioner Caskie is represented as feeling that any consideration he has given the idea has not wedded him to it. On the contrary he is represented in usually well-informed circles as being entirely open-minded in connection with that or any other proposal which may come before him for consideration.

Likewise Commissioner Miller, who advanced the single-corporation idea of Salt Lake City as something which he was confident could be worked out "if there becomes sufficient public interest in and demand for such procedure," is understood also to retain an open mind on the whole subject. He is represented as feeling that while the proposal looks good among others being advanced, he would nevertheless be open to conviction that there is a better solution. When Mr. Miller, who was then chairman of the I. C. C., advanced the single-corporation idea at Salt Lake City, he had previously discussed the difficulties of regulating a competitive industry, calling the regulation of utility rates "a simple job compared with that for railroads," where "competition is so keen between individual roads as well as, in later years, with other forms of transportation." He went on to discuss railroad difficulties and thought the "logical solution" would be "one national railroad system." An abstract of Mr. Miller's Salt Lake City address was published in the *Railway Age* of September 4, 1937, page 308.

Meanwhile Senator Wheeler of Montana, who is also scheduled to attend the White House railway meetings, suggested federal incorporation of railroads as he opened last week's sessions of the Senate interstate commerce committee's investigation of railroad finances. Also, Senator Wheeler, in a recent radio address, repeated the proposed railroad legislative program which he outlined in his February 8 address before the Washington, D. C., Transportation Club. The latter was reported in the *Railway Age* of February 12, page 298.

Another idea, characterized by its publicists as being "very much in the planning stage" would contemplate the setting up of a special court of railroad reorganization. Reorganization proceedings now before the I. C. C. would be transferred to such court and new applications would be made to it. The plan was said to have been prepared "in the inner circles of the New Deal's left wing."

Train-Limit Hearing Suspended

House committee on interstate and foreign commerce hearings on the train-limit bill (S. 69) were suspended on February 18 subject to the call of the chair. It is understood that Chairman Lea will not resume the sessions until after the first of next month.

Last week's sessions, subsequent to those reported in the *Railway Age* of February 19, brought forth several additional shipper, chamber of commerce and other business organization witnesses in opposition to the measure which would limit the length of freight trains to 70 cars. Some 15 of these witnesses made brief presentations at the February 17 session while four others appeared on February 18. When hearings are resumed the Association of American Railroads is expected to continue with the presentation of the railroad case which was interrupted to permit the railroad users to appear.

Beyer Commends Railway Labor Act

Mediation Board head tells N. Y. Railroad Club policy of act frees the industry

In speaking on Railroad Labor Relations Today at the February meeting of the New York Railroad Club, Otto S. Beyer, chairman of the National Mediation Board, discussed the opportunity which railroad labor has to exercise a constructive influence on the future progress of the railroad industry.

"We all realize," said Mr. Beyer, "that the railroads are now confronted with problems whose solution challenges the resourcefulness and statesmanship of both our managers and employees. . . . It is clear that unless ways are found to cooperate with them constructively, railroad service stands to suffer and railroad employment to decline."

Extracts from Mr. Beyer's address follows:

"From the managerial standpoint, I wish to emphasize that the policy expressed by the Railway Labor Act has definitely freed the railroad transportation industry of menaces and influences inimicable to safe, efficient and reliable transportation service. The menaces I have particular reference to are the dangers of strikes—sit-down and otherwise. The influences I have reference to are dissatisfaction, unhappiness, low morale and the like, which are apt to grip large numbers of employees when they develop the conviction that their interests as wage earners individually and collectively are not deserving of safeguards analogous to those provided for other interests party to the industry that employs them. Railroad officers, while not relieved of the need of conferring with the representatives of their employees when differences arise, need lose no sleep either over the likelihood of abrupt breakdowns in labor relations through strikes or other forms of interference with operations, or the undermining of the morale of their employees through subversive efforts or failure on the part of their employees to perform their duties as they should be performed.

"There is no industry in which the rights of the employees as wage earners are more firmly established than on the railroads." Mr. Beyer expanded on this statement, as will be noted from the quotation in the editorial comment on labor relations on page 363.

"In addition to the time and energy which they expend in the performance of their duties and for which they receive compensation totaling over two billion dollars annually," said Mr. Beyer in another part of his address, "they also play a very active part in the economy with which supplies and materials are used on railroads, as well as in the efficiency with which the equipment and facilities are operated by the railroads.

"The quality of the service rendered by a railroad is, to a large extent, also in the employees' hands. The reputation of a

railroad for good service and the resultant public goodwill is a product largely of the employees' making.

"Again, railroad employees, by virtue of their very number, their grasp of the myriad detailed processes that go to make up railroad operation, their constant intimate contact with these processes, are in an exceptional position to determine how these processes can best be performed and also to devise new and better ways of doing them.

"And lastly, the strategic position of railroad employees in the public relations of the industry should be appreciated. Large in numbers, uniformly dispersed throughout the population, conscious of the fact that they are engaged in a service indispensable to the public welfare, railroad employees individually and through their labor organizations have it definitely within their power to help shape the attitude of the public to the railroads.

"As I see it, the most pressing problem at the moment is to create an enlightened appreciation of the predicament in which the railroads find themselves. I can think of no large group in our nation better equipped for this purpose than our million and one-quarter railroad employees. They have the training and the experience; they are on the job every day; they are to be found in every part of the country; and above all, they have a vital stake in their industry, since it gives them their daily bread and butter.

The sooner their collective help is mobilized, the quicker they are oriented to our railroad transportation situation, the earlier they are given an effective voice through integration with management, the better it will be for the ultimate solution of our railroad problem.

"To make the most of their latent ability to help in the reconstruction of the railroad industry, the employees and particularly their labor organizations, as far as their own internal relationships are concerned, must set an example. In the matter of so-called jurisdictional disputes it is eminently desirable that they compose them amicably and, in fact, go a step further and agree among themselves on plans that will prevent them from arising.

No kind of labor trouble is more inimicable to the effectiveness of labor in any direction than quarreling over matters of representation.

"Basically, the employees have every reason to want to enlarge their usefulness, their effectiveness, in the industry. By a combination of wage adjustments and legal enactments in the form of the Railroad Retirement and the Social Security Acts, they have strengthened their equity in the industry as compared with 1933 by almost 25 per cent. The wage increases of last summer and fall alone approximate $315,000,000 and may be said to be in the nature of an investment to improve the human relations of our railroads. Prior to 1933 the employees lost heavily in jobs. Since then, except for seasonal and cyclical rises and declines in employment, they have held their own. But who can say that they will continue to do so in the years to come, especially if our railroads lose out in the competitive struggle?"

President Signs Farm Bill

The President has signed the Agricultural Adjustment Act of 1938 which carries with it a provision authorizing the Secretary of Agriculture to intervene in rate cases affecting agricultural products.

Waterways to Buy New Barges

The Inland Waterways Corporation is planning to purchase 20 barges, estimated to cost from $1,500,000 to $3,000,000, while the Warrior River Terminal Company plans to spend approximately $100,000 for equipment.

March A. A. R. Safety Poster Summarizes Monthly Slogans

The poster issued by the Safety Section, Association of American Railroads, as the March installment of its "All the Year—Every Year—Safety Program," contains small reprints of eight of the posters which have been issued during past months to drive home safety education to railroad employees. It is here emphasized that the major theme of each of the posters has been "Look Both Ways and Live," a slogan applicable to all of the individual situations illustrated.

Lehigh Valley to Run Fan Trip

The next "fan" trip for New Yorkers is to run over the Lehigh Valley to Hazleton, Pa., and Ashmore on Sunday, March 6. Special cars attached to train No. 6 will leave Pennsylvania station, New York at 8:15 a. m. At Mauch Chunk, Pa., the trip cars will be attached to the branch train and arrive at Hazleton for luncheon. After an inspection of the Lehigh Valley enginehouse at Ashmore, the cars will be coupled to the rear of the eastbound Black Diamond and arrive back in New York at 8:45 p. m. The trip is sponsored by Railroad Enthusiasts, Inc., the Railway & Locomotive Historical Society and Railroad Magazine. Tickets cost $3.

Western Railway Club to Meet Jointly with Engineering Groups

The Western Railway Club on March 16 will hold a joint dinner and meeting with the American Railway Engineering Association, the National Railway Appliance Association, the Maintenance of Way Club of Chicago, and the Western Society of Engineers, in the Hotel Sherman, Chicago. At that time a paper entitled "Rail Damage and the Relation of Locomotives Thereto" will be presented by A. A. Miller, engineer maintenance of way, Missouri Pacific, and D. S. Ellis, chief mechanical officer, Chesapeake & Ohio. The reception will begin at 6 p.m., the dinner at 7 p.m. and the meeting at 8 p.m.

Free Use of Tracks Offered Passengers

When passengers protested because the Gulf, Mobile & Northern curtailed its passenger service between New Orleans, La., and Covington, I. B. Tigrett, president of the railroad, offered them free use of all facilities between the two points in return for a release from any obligation to run any trains. In addition, the company would continue to pay taxes on the property, which amount to $5,000 annually. Commuters protested against a time change which brings them into New Orleans at a late morning hour and contended that even if the railroad loses money by maintaining the old schedule, the proceeds from its freight business more than offset the loss. In denying this contention, Mr. Tigrett made the following offer:

"We are not making any money on our freight trains. For the benefit of those who may not be willing to accept this statement as true, we hereby agree to give to any substantial organization the free use of our tracks, depot facilities and other realties and in addition to continue to pay taxes which now amount to nearly $5,000 a year. The only stipulation we would exact in return is a release from any obligation to run any trains ourselves."

Kansas Conference to Feature Locomotive Operation

The Kansas State Board for Vocational Education is planning a train handling and locomotive devices conference, to be held in the Chamber of Commerce Building, Kansas City, Kan., March 29 to April 1, inclusive. The conference leader will be C. M. Drennan, Kansas State Teachers College, Pittsburg, Kan.

January Locomotive Shipments

January shipments of railroad locomotives, as reported by the country's principal manufacturing plants to Department of Commerce, totaled 35 locomotives as compared with 25 in January, 1937, and none in January, 1936. This year's January total included 14 steam locomotives and 11 Diesel-electrics for domestic service and 10 steam locomotives for export.

Unfilled orders at the end of January totaled 156 locomotives, including 106 steam, 26 electrics and 21 Diesels for domestic service and 3 steam for export. Unfilled orders at the end of January, 1937, totaled 401. These figures do not include locomotives built in railroad shops, or "self-propelled cars of any description."

Jig-Saw Puzzles Put to Work on Claim Prevention

The Great Western (Great Britain) is distributing some 22,000 jig-saw puzzles to employees engaged in the handling of freight, as a step in a campaign to reduce damage to goods carried by the road. Each puzzle, when pieced together, shows a small boy ruefully examining a much-battered model locomotive which he has taken from an equally damaged packing case, while his sister sheds sympathetic tears. The puzzle bears the inscription: "Wouldn't you be annoyed if your goods arrived damaged?" Great Western officers are of the opinion that this message will encourage employees to co-operate closely in minimizing freight loss and damage.

Unions May Regulate Seniority of Members

Labor unions may legally regulate the seniority of their members, according to a ruling made by the Colorado supreme

court. In this case Michael H. Capra, a fireman for the Denver & Rio Grande Western, filed suit in the district court at Denver, charging he had been discriminated against in 1934, when he was transferred to the Denver division of the railroad from the Salida division and placed at the bottom of the seniority list, and asked the court to make the brotherhood recognize his Salida division seniority at Denver. The district court dismissed the case and the state supreme court affirmed this decision on February 21.

Monon Reorganization Hearings Are Resumed

Hearings in the reorganization proceedings of the Chicago, Indianapolis & Louisville were resumed before the Interstate Commerce Commission on February 23. E. R. Oliver, vice-president of the Southern, told the commission that the Monon "could not exist" without affiliation with strong trunk lines. He also said that he was authorized to state that the Southern did not feel warranted to pay an assessment to retain proprietary control of the Monon. The Southern and the Louisville & Nashville now jointly control the Monon. One plan now before the commission calls for an assessment of the Southern and the L. & N.

S. A. L. Truck Route

Joint Board No. 205, composed of Eugene S. Mathews of Florida, has recommended in a proposed report that the Interstate Commerce Commission grant the Seaboard Air Line a certificate for common carrier truck operations over a specified route between Jacksonville, Fla., and River Junction. The report finds that the proposed operation "will be competitive to other motor carriers to only a minor extent;" most of the traffic transported will originate at points on the S. A. L. or other railroads, and "would be traffic which protestants would have no opportunity to obtain."

Also, the report adds, there is a public demand for the co-ordinated service which "is an improvement over rail or truck service and the public is entitled to the best service that common carriers can offer."

Czechoslovak System to Inaugurate Extensive Container Service

The Czechoslovak State Railways expects to place in service, before the end of 1938, 1,000 containers for the shipment of merchandise and, further, to purchase an additional 2,000 containers during 1939 and 2,000 more in the next few years, which, when delivered, will satisfy total requirements now quoted as being close to 5,000 containers. According to plans outlined by the office of the American commercial attache at Prague, Czechoslovakia, the containers are to be built in two sizes, one class to have a maximum loaded weight of 1,575 kilograms (3,465 lb.) and the other a maximum gross weight of 5,250 kilograms (11,550 lb.).

The containers are to be made available to manufacturers on a rental basis. Tariff for the service will be based on charges for the net weight only of the merchandise carried, plus a rental for the containers proportionate to the distance of the haul. No charge will be made for the transportation of empty containers back to origin. Although present plans call for use of the containers in domestic service only, it is expected that agreements will be made in the near future for acceptance and delivery of containers in transfer with railways of Austria, Germany, Hungary and Poland.

German System Reports All-Time Traffic Record in 1937

The German National Railways reports that both freight and passenger traffic for the fiscal year 1937 constitute an all-time record, exceeding even the traffic figures of 1929, which, subsequent to 1937, held the record. The total passenger-miles rolled up in 1937 exceed those of 1929 by approximately 7 per cent, and freight ton-miles exceed 1929's figure by 6 per cent. As compared with 1936, the year 1937 shows an increase of 16 per cent in passenger-miles and 15 per cent in ton-miles.

Operating revenues for 1937 show a less marked increase, due mainly to lower average revenues per ton-mile and per-passenger mile as the result of substantial decreases during the year in passenger fares and freight tariffs. Thus, passenger revenues in 1937 comprise only an 8 per cent increase over those in 1936 and freight revenues comprise a 12 per cent increase over the previous year. The operating ratio of the national system is estimated as between 85 and 86 per cent for 1937, as compared with 88.16 per cent for 1936. Operating expenses increased 7 per cent in 1937 as compared with 1936.

Equipment on Order

Class I railroads on February 1, had 6,563 new freight cars on order compared with 36,036 on the same day last year, according to the Association of American Railroads. On January 1 there were 7,947 new freight cars on order. New steam locomotives on order on February 1 totaled 110 compared with 131 on January 1 and 362 on February 1, 1937. The railroads also had 21 new electric and Diesel locomotives on order on February 1 compared with 30 on January 1 and 10 on February 1, last year.

In January 2,148 new freight cars were installed in service compared with 3,172 in January, last year. Twenty-seven new steam locomotives and 17 new electric and Diesel locomotives were put in service in January compared with 12 steam and seven electric and Diesel locomotives in January, 1937.

Fire Codes for Liquids and Gases Issued by N. F. P. A.

A 360-page volume containing complete information on the safe handling of flammable liquids and gases and listing 36 standards and regulations, including ordinances and recommended good practice requirements, has recently been published by the National Fire Protection Association. Compiled by Robert S. Moulton, and entitled "The National Fire Codes for Flammable Liquids and Gases—1938," the book has been prepared by technical committees made up of representatives of the major interests concerned in fire protection and contains suggestions widely accepted as the best practices of fire protection. The book sells at $1.50 per copy and may be obtained from the National Fire Protection Association, 60 Batterymarch street, Boston, Mass.

Illegal Travel Agencies Exposed

Startling revelations concerning the so-called "wildcat, fly-by-night" travel and tourist bureaus and operators of unlicensed motor vehicles have been made public in a news letter issued by the National Association of Motor Bus Operators, Washington, D. C. Herein it is asserted that these illegal bureaus are operating from 1,000 to 2,000 automobiles, presumably private, in daily service between major cities and that annual profits top $5,000,000. Reference is also made to articles appearing in "Scribner's Magazine" for September, 1937 and the "American Police Patrol" for February 1, 1938, both of which expose many of the evils associated with some types of travel bureaus.

The statement of the association urges that newspapers close their advertising to such agencies as have not obtained brokerage licenses from the Bureau of Motor Carriers of the Interstate Commerce Commission, as a protection to the traveling public and to legitimate transportation agencies.

Highway Crossing Protection Statistics Released

An eight-page booklet containing information on the numbers and types of highway grade-crossing protection devices according to various classifications has been published by the Bureau of Railway Signaling Economics, New York. The information presented covers the period 1925-1936, and includes a list of specifications for crossing protection installations by states, the numbers of installations of each type made each year since 1925, a summary of the crossing situation as at the end of each year, and a detailed list of the roads utilizing each category of crossing protection. Since most of the statistical groups are compiled from recognized sources hitherto made available, the bureau's publication will serve mainly as a condensed and "handy" reference booklet.

Canadian National Absorbs Cartage Company

The Canadian National has taken over the equipment and facilities of the Canadian Cartage & Storage Co. and placed them under the immediate jurisdiction of the Canadian National Express for operating purposes. Although the former cartage company has performed cartage operations for the Canadian National Railways and predecessor companies for a period of more than 70 years, officers of the road are of the opinion that the consolidation will provide an even more efficient pick-up and delivery service.

Under the purchase agreement Canadian National will acquire the equipment, plants and good will of the cartage company at Montreal and St. Hyacinthe, Que., and Lon-

don, Brantford and Guelph, Ont. So far as possible, the personnel of the cartage company will be retained.

Rates on Carbon Black—One of Items Withdrawn From 115

The Interstate Commerce Commission has found not justified proposed increased carload rates on carbon black from producing points in Louisiana, Oklahoma, Texas and Wyoming to destinations in the United States and Canada. The same decision in I. & S. No. 4337 authorizes proposed increases on the same commodity from producing points in Louisiana, Oklahoma and Texas to Gulf of Mexico ports for export or coastwise movement.

Carbon black is one of the commodities which was withdrawn from the Ex Parte 115 application; and increased rates thereon were published in tariffs to become effective April 20, 1937. These rates were suspended by the commission until November 20, 1937, and subsequently postponed voluntarily by the carriers until March 20. Commissioners Mahaffie, Miller and Caskie did not participate in the disposition of the proceedings.

Railroad Problems Discussed in Forums at Babson Institute

To give its business students an understanding of present-day problems confronting the railroad industry, the Babson Institute, of Babson Park, Mass., has offered during February a series of four weekly lecture forums devoted to railroad subjects and presented by several railroad executives. The series was opened with a general discussion on "Problems of Management and Co-ordination of Railroad Transportation," by Professor W. J. Cunningham of the Harvard Graduate School of Business Administration. H. F. McCarthy, passenger traffic manager, Boston & Maine, spoke on "The Passenger Traffic Department as a Merchandising Organization"; F. J. Wall, vice-president, New York, New Haven & Hartford, spoke on "Freight Transportation"; and W. J. Trowbridge, vice-president, Boston & Maine, concluded the series with discussion of "Railroad Finances."

Argentine Road Reduces Rates and Carload Minimums

The Central Argentine has instituted lower rates on carload freight on hauls of more than 100 kilometers (62 miles) and up to a maximum of 580 kilometers (310 miles) for class I freight, up to 500 kilometers for class II, up to 470 kilometers for class III, up to 440 kilometers for class IV, up to 340 kilometers for class V, up to 300 kilometers for class VI, up to 260 kilometers for class VII, and up to 225 kilometers for class VIII. The new rates will be in force in chief cities on the system to and from all stations within the maximum distances set. Under this arrangement, rates on high-class goods are appreciably reduced, while short-haul traffic in the lower grade commodities is encouraged.

Changes have also been made in classifications so that commodities which have formerly been in classes II, III, and IV, with a minimum weight of 100 kilograms (220 lb.) can be placed in classes III, IV, and V when the shipper has a minimum weight of 1,000 kilograms (2,220 lb.), for which the rates are appreciably lower. Secondly, lower rates can now be obtained by combining commodities of various classifications, which together will satisfy the minimum carload weight rule, although they will be rated individually according to classes just as if each individual class satisfied the prescribed minimum carload weight.

State Operation of Cordoba Central Extended to Four Years

The Argentine State Railways, which by a parliamentary decree in the fall of 1937 signified its intention to operate the British-owned Cordoba Central for a period of one year, effective January 1, as summarized in the *Railway Age* of January 29, page 250, by a subsequent decree will extend the period of operation of the road to four years, the original option for purchase continuing. According to the terms of this latest decree, the state railways will pay an annual rental of £380,000 ($1,884,800) to the Cordoba Central, or 4 per cent on the agreed purchase price of £8,500,000 ($42,160,000). However, if the legislature does not approve the exercise of the purchase option by the end of the four-year period, the state railways will make payment for the last year of operation of an amount equal only to the net profit of the Cordoba company for the fiscal year 1936-1937.

Oral Argument Heard In M. & St. L. Case

The Interstate Commerce Commission heard oral argument on February 23 on the petition of the Associated Railways to dismember and purchase the property of the Minneapolis & St. Louis. Appearing for the six roads which will take over segments of the Minneapolis & St. Louis, W. F. Peter, assistant general counsel of the Chicago, Rock Island & Pacific, told the commission that now was the time for it to do "something" about the problem of consolidation. He went on to point out that the road had always been a problem and that it will continue to be one until definite action is taken. He urged the commission to let the petitioners attempt to solve the problem by splitting up the system of the M. & St. L. The petitioners are asking the commission to reject a proposed report of one of the commission's examiners which found that it would not be in the public interest to permit the dismemberment.

'Frisco Trial Closes

February 17 saw the close of the trial of a suit brought in the New York State

* * *

Courtesy of Locomotive Engineers' Journal

"Uneasy Lies the Head that Pulls the Train"

Supreme Court by J. G. Lonsdale and J. M. Kurn, co-trustees of the St. Louis-San Francisco, to recover a sum of $10,506,090 from the investment banking houses of J. and W. Seligman & Co. and Speyer & Co., which sum is the purchase price of 183,333 shares of stock of the Chicago, Rock Island & Pacific bought by the 'Frisco in 1926. Specifically, the plaintiffs charge that the sum of which they seek recovery was "wastefully" expended by the road under the chairmanship of Edward M. Brown, who is accused of having acted in the transaction under the domination of the defendent banking houses.

The trial opened on January 17 and has been argued, without jury, before Justice Louis A. Valente, as reported in the *Railway Age* of January 22, page 212. Judge Valente has reserved decision on the suit and, in addition, has taken under advisement motions made by the defense counsel for dismissal of the suit. All briefs must be submitted within 90 days.

British Roads Urge Spread of Vacation Period

An appeal to Britishers to arrange their vacations at a date earlier than the peak summer resort months has been made by the British Railways Press Office, London, England, in a 16-page pamphlet containing facts and figures designed to persuade the reader to follow such procedure. Herein it is shown that, due to recent agreements between employers and employees, the increasing numbers of people taking "holidays with pay" in the months of July and August are causing undue congestion and over-crowding at resorts. In support of the "earlier holidays" plans, it is pointed out that the weather is better in the earlier months, that prices are lower, that there is less over-crowding and, most important of all, that travel facilities are more abundant. Figures quoted reveal that the number of passenger journeys made on the four main line British roads in 1936 reached 71,746,000 in August, as compared with 48,417,000 in May and 56,238,000 in June.

Club Meetings

The Canadian Railway Club will hold its next meeting on March 14, at the Windsor Hotel, Montreal, Que. M. J. Gormley, executive assistant, Association of American Railroads, will present a paper entitled "National Transportation Policy." The program also includes motion pictures on a travel subject.

The Southern and Southwestern Railway Club will hold its next meeting on March 17, at 10 a.m., in the Ansley Hotel, Atlanta, Ga. Robert S. Binkerd, vice-president and director of sales, Baldwin Locomotive Works, will present a paper entitled "Making Money with Locomotives."

The Car Department Association of St. Louis will hold its next meeting on March 15, at 8:15 p.m., in the Statler Hotel, St. Louis, Mo. LeRoy Kramer, first vice-president, General American Transportation Corporation, will present a paper entitled "Private Cars and Their Operation."

The Car Foremen's Association of Chicago will hold its next meeting on March 14 at the LaSalle Hotel, Chicago. At that time J. E. Mehan, assistant to superintendent car department, C. M. St. P. & P., will discuss with the A. A. R. committee of the association, proposed changes in the A. A. R. rules of interchange—1939 code.

The Metropolitan Traffic Association of New York will present, on March 10, the fourth in its series of lectures at the Hotel Imperial, New York, to be entitled "Rates in Southwest Docket." On March 24 the subject will be "Principles of Intermediate Application."

Would Permit S. P. Subsidiary to Buy Truck Route

Joseph G. Cooper, assistant chief, Section of Finance, Bureau of Motor Carriers, has recommended in a proposed report that the Interstate Commerce Commission authorize the acquisition by Pacific Motor Trucking Company, subsidiary of the Southern Pacific, of operating rights and property of Humbolt Freight Lines, Inc., on a 300-mile route between Reno, Nev., and Elko. The route "parallels, for almost the entire distance," tracks of the Southern Pacific.

Mr. Cooper would have the commission act favorably on the application provided that "the authority herein granted is subject to such limitations or restrictions as the commission may hereafter find it necessary to impose in order to insure that the service shall be auxiliary or supplementary to the train service of the said railway and shall not unduly restrain competition; and that such steps will promptly be taken as legally are possible and necessary to obtain this commission's approval of the transaction wherein Southern Pacific Company acquired total outstanding stock of Pacific Motor Trucking Company."

Fuel Efficiency Record in 1937

A new improved record in fuel efficiency by locomotives engaged in road and yard service was established by the railroads of the United States in 1937, according to the Association of American Railroads. In that year an average of 117 lb. of fuel was required to haul 1,000 tons of freight and equipment a distance of one mile. This was the lowest average attained since the compilation of these reports began in 1918.

The average in 1937 was a reduction of nearly 28 per cent compared with 1921, in which year the average was 162 lb. It also was a reduction of two lb. compared with 1936 and a reduction of three lb. compared with 1935.

Increased efficiency in fuel consumption in passenger service also took place in 1937. In that year, 15.1 lb. of fuel were required to haul each passenger-train car one mile. This was a reduction of nearly 15 per cent compared with 1921 when the average was 17.7 lb. The average in 1936 was 15.3 lb. and in 1935 it was 15.5 lb.

Class I roads in 1937 used 82,276,671 tons of coal for both road and yard switching service. This was obtained at a cost of $198,953,973. In 1936, they used 80,439,186 tons, the cost of which was $188,572,369. The railroads also consumed in road and yard switching service in 1937, 2,553,723,894 gal. of fuel oil, compared with 2,336,421,839 gal. in 1936.

"The new improved record in fuel efficiency," the A. A. R. statement says, "has been brought about largely from improvements in the construction of locomotives, which have resulted in greater tractive power being produced with reduced fuel consumption, and also from improved methods of operation."

Freight Car Loading

Loading of revenue freight for the week ended February 12 totaled 542,991 cars, a decrease of 21,749 cars or 3.9 per cent below the preceding week, a decrease of 145,532 cars or 21.1 per cent below the corresponding week in 1937 and a decrease of 343,710 cars or 38.8 per cent below the same week in 1930. All commodity classifications except forest products and ore showed decreases under the preceding week, while all commodity classifications except grain and grain products showed decreases under last year. The summary, as compiled by the Car Service Division, Association of American Railroads, follows:

Revenue Freight Car Loading

For Week Ended Saturday, February 12

Districts	1938	1937	1936
Eastern	113,061	155,531	149,102
Allegheny	97,822	147,944	124,877
Pocahontas	39,918	49,321	53,628
Southern	91,082	99,422	92,839
Northwestern	65,079	76,849	64,918
Central Western	88,284	103,677	92,820
Southwestern	47,745	55,779	52,911
Total Western Districts	201,108	236,305	210,649
Total All Roads	542,991	688,523	631,095
Commodities			
Grain and Grain Products	32,256	29,598	28,095
Live Stock	11,015	11,613	9,969
Coal	107,875	155,322	192,491
Coke	5,505	12,143	11,329
Forest Products	26,853	35,091	26,469
Ore	7,136	11,071	5,615
Merchandise L.C.L.	146,897	162,813	144,078
Miscellaneous	205,454	270,872	213,049
February 12	542,991	688,523	631,095
February 5	564,740	671,227	621,686
January 29	553,176	653,022	621,890
January 22	570,333	665,346	584,637
January 15	580,600	696,035	611,347
Cumulative Total, 6 Weeks	3,364,154	4,074,199	3,685,508

In Canada.—In the February 12 week carloadings in the Dominion totaled 43,515, down 6.2 per cent from a year ago and down 3.5 per cent from the preceding week, according to the compilation of the Dominion Bureau of Statistics.

Total for Canada:	Total Cars Loaded	Total Cars Rec'd from Connections
February 12, 1938	43,515	21,849
February 5, 1938	45,099	22,388
January 29, 1938	44,439	22,369
February 13, 1937	46,370	27,051
Cumulative Totals for Canada:		
February 12, 1938	268,453	134,458
February 13, 1937	277,884	161,010
February 8, 1936	234,832	129,954

N. & W. Magazine Narrates History of the Road

A brief history of the Norfolk & Western which this year celebrates the 100th anniversary of the opening of the nine-mile City Point railroad between Petersburg, Va., and City Point, appears in the

February issue of the "Norfolk & Western Magazine." Complete in seven and one-half pages the article relates the story of the road from the earliest negotiations for the parent company down to present developments. In the narrative, financial operations are related only briefly, while the major emphasis is placed upon physical developments of the properties with special reference to the efforts made by the Norfolk & Western to develop the rich coal fields in its territory. Old photographs and facsimiles of early pictures and developments supplement the text. The cover of the issue contains a large reproduction of a painting of the famous "Little Tunnel" in Montgomery County, Va., taken from a picture album of the state of Virginia.

Pennsylvania to Run Excursions to Shops

Excursions to its Columbus shops, similar to those operated to its Altoona shops last year, will be operated by the Pennsylvania on April 24. Excursions will be operated from Chicago, Detroit, Mich., Toledo, Ohio, St. Louis, Mo., Indianapolis, Ind., Terre Haute, Kokomo and other points for rail and locomotive enthusiasts, camera fans, model builders, and bargain-hunting excursionists. Special trains will be operated on fast schedules which will permit convenient morning departures, a stop of several hours at Columbus and a return home before midnight. One of the attractions at Columbus will be a CC-2 mallet type locomotive. While the excursions are open to the public, other organizations have been invited to participate, including the Railway and Locomotive Historical Society, Chicago Chapter; the Railroad Club of Chicago, the Model Builders Guild of Chicago, the Detroit Model Railroad Club, the Indianapolis Railroad Fans' Association, the Indianapolis Model Railroaders Club, the St. Louis chapter of Railroad Enthusiasts, Inc., and the Kokomo Railroad Club.

South African Electrification Nears Completion

In recent years the high price for gold has stimulated mining activity and travel in the Witwatersand Gold Mining Area in South Africa, necessitating improved facilities for handling the suburban passenger traffic. The project, called "The Reef Scheme" with route mileage of 126 or a single-track equivalent of 310 miles, was started in 1935.

Electric equipment was supplied by the General Electric Company for all the rolling stock, which consists of 115 4-motor cars, 80 operating trailers, and 231 non-operating trailers. Included in this equipment were traction motors, motor-generator sets, compressors, exhausters, and automatic control for multiple-unit train operation. Motor cars and trailers for the project were built in England.

Power is being supplied from the joint system of the Victoria Falls and Transvaal Power Company, Ltd., and the Electricity Supply Commission through mercury-arc rectifiers at 3000 volts d.c. Steelwork for the overhead system, made up for the most part from discarded rails and boiler tubes, was fabricated largely by the use of electric welding. About 10,000 tons of steel were used.

Lily Pons Christens Reading Streamliner "Crusader"

"Crusader" was the name given the Reading's new stainless-steel streamlined train by Lily Pons, Metropolitan Opera, motion picture and radio star, in a christening ceremony in the Reading Terminal, Philadelphia, Pa., on February 23. Miss Pons broke a bottle of champagne on the driving wheels of the streamlined locomotive at 7:15 p.m. and later removed a huge American flag covering the new name.

E. W. Scheer, president of the Reading and Central of New Jersey, handed a check for $250.00 to P. W. Silzer, a business man of Plainfield, N. J., as the winner of a name contest conducted by the railroad. Of the many thousand names submitted, "Crusader," given by Mr. Silzer, was selected by a committee of 29 railroad officials as the most appropriate.

Country Elevators Oppose Train Limit Bill

Protest against the passage of Senate bill No. 69, limiting the length of trains, has been made by W. R. Scott, executive vice-president of the Associated Southwest Country Elevators, in a letter to the Interstate and Foreign Commerce Committee of the House of Representatives. The letter terms the bill "rank class legislation for a limited few, the effects of which would be to impair and undermine the present highly efficient system of handling grain and grain products and result in lower prices to the producer."

"To carry out the provisions of this train length restriction," the letter says, "would result in a sharp increase in railroad operating costs. To favor the small preferred minority of selfish interests who would benefit from such legislation, the farmer and shipper of grain and grain products would be shouldered with a tremendous burden in increased transportation costs, delayed service and reduced prices.

"Out of an additional annual freight charge estimated at $180,000,000, the grain producer, handler and processor would be compelled to pay $20,000,000 per year under normal crop production. The immediate effect of such an unfair and unnecessary advance in shipping costs would be reflected in depressing the prices received by grain farmers.

"Of great import also would be the physical effect on the movement of grain, which in its turn would have the effect of further impairing farm prices for grain. Months of careful planning and preparation are necessary to accumulate necessary cars for moving the grain crop to market. With the modern day use of combines in harvesting, grain now flows to market in a period of a few weeks instead of several months as formerly. This speeding up of transportation has been accomplished smoothly and efficiently in the face of fewer available cars and locomotives through the close co-operation of shippers, receivers and carriers and the efficiency resulting from present day train lengths. The proposed reduction in the length of trains, together with reduced motive power of the carriers, would make a serious delay in the turn-around of these cars inevitable, and car shortages would be inevitable."

Chicago Court Stays Rail Fuel Prices

The United States district court of appeals at Chicago on February 17 granted a temporary injunction to seven Illinois and Indiana coal companies against the National Bituminous Coal Commission's railroad fuel coal code prices at the mines. The action is similar to that given the Association of American Railroads last week in the District of Columbia circuit court of appeals at Washington.

The companies petitioned for a restraining order, alleging discrimination and failure of the coal commission to extend a hearing on a request for relief as pro-

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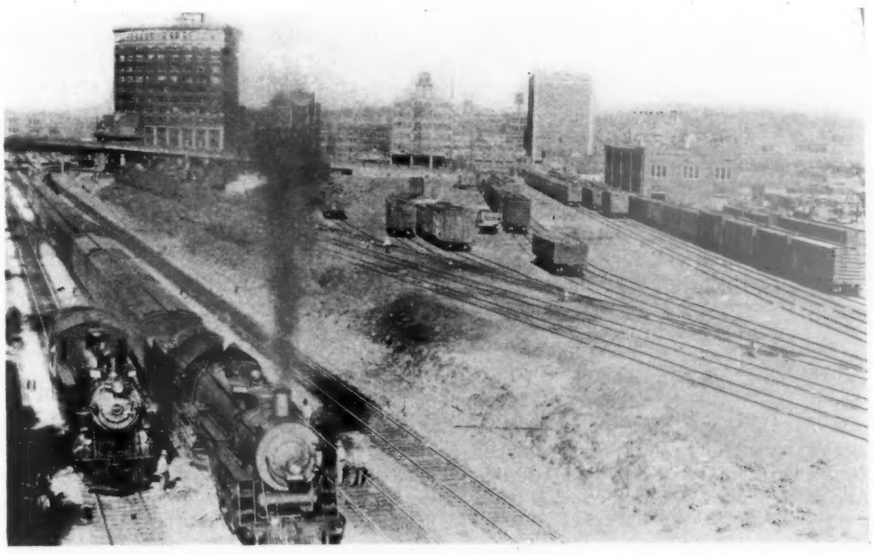


Photo by Collons

Santa Fe Fast Mail Leaving Kansas City, Mo.

vided for under the Guffey law. The stay order is pending a hearing. The companies are now permitted to sell railroads coal at prices other than the code levels established by the coal commission.

The court stated that while the injunction issued in favor of 209 railroads in the federal appeals court in the District of Columbia last week, in substance, made inoperative orders of the coal commission, which fixed minimum prices of coal for railroad use, "We find that there are provisions which impose penalties on a code member who fails to comply, and there may arise a situation where doubt and uncertainty as to the extent of the order is concerned. It is, of course, apparent that the same order applicable to the railroads should apply to coal companies who sell coal to the railroads. It would be most confusing if the order of the commission were restrained as to certain railroads or in certain districts and there was no like restraining order in other districts."

Westinghouse Career Presented in Forum Reprint

The views of 20 men on the life and achievements of George Westinghouse, inventor of the railroad air brake, developer of many electrical devices and founder of the Westinghouse Air Brake Company and the Westinghouse Electric & Manufacturing Company, have been published in an illustrated, 78-page book, recently made public. Comprising a reprint of a forum presenting the career of Westinghouse on the 90th anniversary of his birth, conducted by the American Society of Mechanical Engineers, in 1936, the book is replete with photographic illustrations which dramatize the many fields of activity to which the inventor dedicated himself. The work serves not only as a panel biography, but as a text of engineering progress as well, for the author-editor, Charles F. Scott, professor emeritus of electrical engineering at Yale University, and most of the co-writers who "fooled" their memories for the forum, were eyewitnesses not only of the development of the alternating current system, but of the coming of the high-speed steam turbine, the air brake, the improved transformer, the air-spring, the electric railway and other engineering feats associated with the name Westinghouse.

The list of co-authors includes W. L. Batt and Ambrose Swasey, past presidents of the American Society of Mechanical Engineers; Ralph Budd, president of the Burlington; A. W. Berresford and L. B. Stillwell, past presidents of the American Institute of Electrical Engineers; S. M. Vauclain, chairman of the Baldwin Locomotive Works; J. V. B. Duer, chief electrical engineer, Pennsylvania; W. S. Murray, consulting engineer, formerly with the New York, New Haven & Hartford; John F. Miller, vice-chairman, Westinghouse Air Brake Company; and Francis Hodgkinson and N. W. Storer, both consulting engineers retired by the Westinghouse Electric & Manufacturing Company.

The book has classed the individual sketches under five topics,—(1) the air brake; (2) alternating current; (3) the steam turbine; (4) railway electrification; (5) industrial relations. A general review of Mr. Westinghouse's career by Mr. Batt precedes the presentation of the main topics and an epilogue by Mr. Scott completes the panel discussion.

The book also includes a reprint of a speech on "Achievements of Westinghouse as Factors in Our Modern Life" by James R. Angell, retired president of Yale University, and an address entitled "George Westinghouse, the Man," by Paul D. Cravath, attorney, both of which were delivered at the commemoration program.

New Transport Bill in Canada

The transport bill (regulating all forms of transportation, as the railways are regulated) which was thrown out by the Canadian Senate last session, after having received a rough ride in that body's railway committee, will be reintroduced in the Canadian Parliament this session by Clarence D. Howe, Minister of Transport. Notice of his resolution on which the legislation will be based has been given in the House. It reads as follows: "That it is expedient to introduce a measure conferring authority upon a Transport Commission, (the Board of Railway Commissioners to be known as such) to license, regulate and control the transport of passengers and goods by railway, ships and aircraft, and to fix license fees and transportation tolls and charges, and regulate and control other matters incidental thereto."

It will be noted that regulation of highway traffic is omitted, and it is also known that the Minister proposes to exempt full cargoes or bulk cargoes on the Great Lakes from the proposed rate control, which would remove the chief objection raised last session against his proposed control of lake freight rates, on the ground that it might have the effect of establishing minimum, instead of maximum rates for grain carriage.

Last session's stiffest fights were centered against this lake rates control which would imperil the present low rates for Western grain shippers and against the attempt to regulate rates for highway transport. Practically all of the provincial governments appeared before the Senate committee last session to oppose this part of the bill, chiefly on constitutional grounds.

The Howe bill of last session sought to regulate that small fraction of highway traffic that was interprovincial by regulating that part of the tolls that was interprovincial. It is believed that with the exception of the highway rate regulation and the exemption of bulk cargoes on the lakes, the transport bill will closely resemble last session's measure. That bill also provided regulation of rates on water carriage between the Atlantic and the Pacific coasts through the Panama canal.

A. R. E. A. Convention Program

The American Railway Engineering Association will hold its thirty-ninth annual convention at the Palmer House, Chicago, on March 15-17. In addition to the presentation of the reports of committees, the program includes the conferring of honorary memberships on four past presidents of the association: W. B. Storey, retired president, A. T. & S. F.; C. A. Morse, retired chief engineer, C. R. I. & P.; J. G. Sullivan, retired chief engineer, Western lines, C. P. R., and J. L. Campbell, retired chief engineer, N. W. P.

On Thursday noon, Charles Donnelly, president of the Northern Pacific, will address the association at its annual luncheon. On Wednesday evening the association will join with the Western Railway Club in a dinner and program on Rail Damage and the Relation of Locomotives Thereto, with A. A. Miller, engineer maintenance of way, M. P., presenting the engineering viewpoint and D. S. Ellis, chief mechanical officer, C. & O.-N. Y. C. & St. L.-P. M., describing the progress made by the mechanical department in solving this problem.

The program of the convention, with the order of presentation of reports follows:

TUESDAY, MARCH 15

Morning Session—9:45 a.m.

Convention called to order
Address by President J. C. Irwin, B. & A.
Conferring of honorary memberships
Address by J. M. Symes, vice-president, A. A. R.
Reports of secretary and treasurer
Reports of committees on:
- Standardization
- Signals and Interlocking
- Buildings

Afternoon Session

Reports of committees on:
- Electricity
- Yards and Terminals
- Shops and Locomotive Terminals
- Water Service, Fire Protection and Sanitation
- Uniform General Contract Forms

Adjournment at 4 p.m. to visit exhibit of the National Railway Appliances Association at International Amphitheater.

WEDNESDAY, MARCH 16

Morning Session—9 a.m.

Reports of committees on:
- Roadway
- Ballast
- Ties
- Track
- Complete Roadway and Track Structure
- Highways

Association Luncheon—12 o'clock

Afternoon Session

Reports of committees on:
- Rail
- Stresses in Railroad Track
- Clearance
- Maintenance of Way Work Equipment

Wednesday Evening

Joint meeting with Western Railway Club at Hotel Sherman

THURSDAY, MARCH 17

Morning Session—9 a.m.

Reports of committees on:
- Wood Bridges and Trestles
- Masonry
- Iron and Steel Structures
- Impact
- Economics of Bridges and Trestles
- Waterproofing of Railway Structures
- Economics of Railway Location
- Economics of Railway Operation
- Economics of Railway Labor

Afternoon Session

Reports of committees on:
- Wood Preservation
- Rules and Organization
- Records and Accounts
- Waterways and Harbors

Closing business

Would Bring Red Caps Under Definition of "Employee"

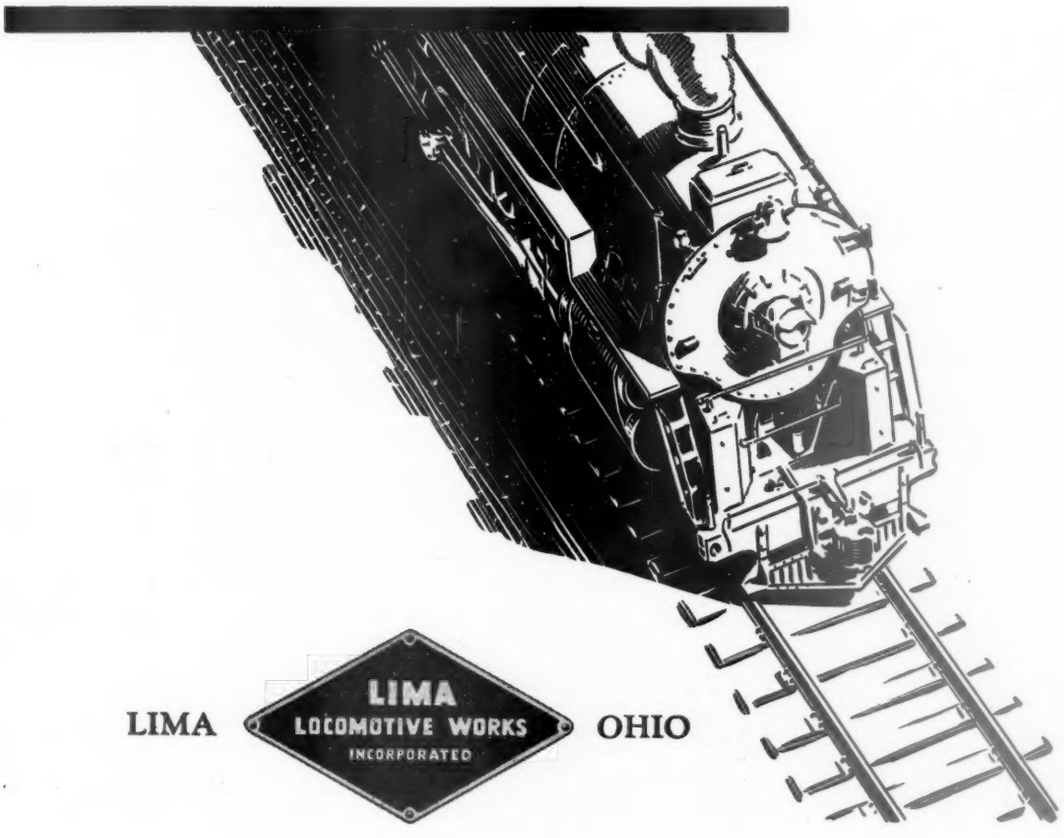
"Red caps" and other station attendants with similar duties would be brought within the term "employee" as defined in the fifth paragraph of the Railway Labor Act's section 1 if the Interstate Commerce Commission follows the recommendations of a proposed report by Examiners Steer and Harris. The examiners reject

Continued on next left-hand page

NEW POWER IS NEEDED

The railroads which bind this country into one great economic unit are still the best means of providing low cost transportation.

● But if they are to maintain their competitive advantage they need modern motive power to speed operation and reduce costs.



LIMA LIMA LOCOMOTIVE WORKS INCORPORATED OHIO

the idea that a stated wage is essential to create the employee-employer relationship, finding that "the test of such relationship is whether the alleged master or employer has the right to hire or discharge the servant or employee or exercise authority with respect to the manner and conduct of the work to be performed."

That the railroads do these things with respect to red caps is found from an analysis of returns to the questionnaire which was served on all Class I roads to gather data for a record in the proceedings. The investigation in Ex Parte No. 72 (Sub-No. 1) grew out of petitions of employee organizations who requested the commission to amend or interpret its previous orders so as to include station attendants within the term "employee."

I. C. C. Secretary W. P. Bartel attached to the proposed report a notice stating that "in view of the nature of this proceeding and the character and volume of the information which has been developed from answers to a questionnaire, it has been deemed desirable to issue a proposed report." Also, "the circumstances seemed to make it desirable" to allow 45 days, instead of the usual 20, for the filing of exceptions; and replies may be filed within 20 days thereafter. Oral argument "may be granted if requested within the time allowed for filing exceptions."

The proposed report, after quoting the pertinent provision of the Railway Labor Act, proceeds to discuss information gathered in replies to the questionnaire. The examiners adopt the term "red cap" as the one most extensively used to designated station attendants variously classified. The questionnaire provided for separate returns for persons receiving salaries or wages, designated as class A; and for persons whose only compensation is through tips, designated as class B. The returns covered 4,300 persons of whom about 1,150 are in class A. Generally, however, "red caps" in both classes are subject to rules, either verbal or written, particularly as regards safety of passengers and baggage, courtesy to passengers and general conduct. They are subject to reprimand, dismissal, suspension, or other penalties for infractions of the rules."

The report goes on to point out, among other things, that nearly half of those in class A are members of a relief, benefit or hospital association maintained by the respondents, and while those in class B are not usually members of such associations, there are such members at a few stations. About one-third of the class A red caps are members of labor organizations having agreements with the railroads; and such agreements have been made for class B red caps at a few stations. Seniority is applied among red caps, and most of those in class A and 2,000 in class B have been considered eligible to receive free transportation. In fact "practically all" of the reporting companies conceded class A red caps to be employees and such status was conceded to about 300 in class B.

After a discussion of previous I. C. C. and Director General references to red caps the report cites the Railroad Retirement Act's exclusion from its provisions of persons who receive "no compensation other than tips." It goes on to suggest that lack of such a provision in the Railway Labor Act would indicate that Congress did not intend any such exclusion. Also cited are National Mediation Board decisions which have found red caps to be employees.

All of which leads the examiners to the conclusion that "The services of red caps are usually engaged in much the same manner as are the services of respondents' employees generally, and red caps are under the general and continuing authority of the station master or similar officer of substantially equal rank and their assistants to supervise and direct the manner of rendition of service. They are also subject to rules with respect to dress and manner of conduct and usually to a variety of other rules, for infractions of which they are subject to reprimand and dismissal. Most companies have considered that they were employees in granting them free transportation. The facts with respect to red caps show that they are employees within the generally accepted meaning of that term. There is no obvious reason for excluding them from the term 'employee' as it is used in the Railway Labor Act."

Also, the report had previously noted, "there is no indication that the authority of any of the head red caps or captains is of a nature to bring them within the term 'official' as distinguished from the term 'employee' as used in the Railway Labor Act."

Says Pennsy Gave Aid to Shippers

(Continued from page 389)

often traffic was diverted away from the railroad shortly after the loans were guaranteed.

Senator Wheeler sharply criticized the Baltimore & Ohio, Erie, and other roads competing with the Pennsylvania, "for this wasteful expenditure of their stockholders' money."

At the February 17 session of the committee, Senator Wheeler suggested federal incorporation of railroads as a means of affording complete regulatory control of carriers. In opening the hearing, the Senator read a short statement in which he said that there would be considered "two illustrations of the unregulated, uncontrolled expansion of railroad systems through purchase of stocks: one, the acquisition of stock of the Erie by the Van Sweringen group; the other, the acquisition of stocks of the Boston & Maine by Pennroad Corporation." According to Senator Wheeler, "The two most striking illustrations of holding companies in the railroad field are the Van Sweringen system and the Pennsylvania-Pennroad system."

"Both represent undisciplined, unregulated corporate expansion in the railroad field through purchase of stocks of railroad after railroad," he said. The interests which accumulated the holdings represented by these two systems were limited in their acquisitions only by their own self-restraint and the limits on cash and credit which they could command through ability to sell securities to the public."

Senator Wheeler presented a committee statement showing details of the acquisition of 19.25 per cent of the voting stock of the Boston & Maine by the Pennroad Corporation at a cost of $23,637,708. It was also brought out that the Virginia Transportation Corporation, a Van Sweringen subsidiary, had acquired through April, 1931, 981,400 shares of Erie stocks at a total cost of $41,976,445.

The Senator also raised the question of whether or not the acquisition of the stocks of the Erie was not wholly void because of provisions of section 54 of the New York public service commission law relating to the acquisition of more than 10 per cent of the stock of a railroad company. It was later revealed that the New York public service commission has the question under consideration and that Chairman Wheeler had exchanged correspondence with the Interstate Commerce Commission regarding the matter.

Herbert Fitzpatrick, chairman of the board of the Chesapeake & Ohio, declined to express an opinion in view of the fact that the entire question was before the New York public service commission.

Senator Wheeler concluded the session by criticizing the appointment of President Denney of the Erie as one of the trustees of the company because he did not think that an officer of the company should be made a trustee. Senator Wheeler believes that the present law should be changed so that officers of a railroad company cannot be made trustees in reorganization proceedings.

Senator Wheeler, in a radio speech on the National Farm and Home Hour on February 19, made the same recommendations regarding railroads as he advocated in his speech before the Washington Transportation Club which was reported in the *Railway Age* for February 12, page 298.

* * *

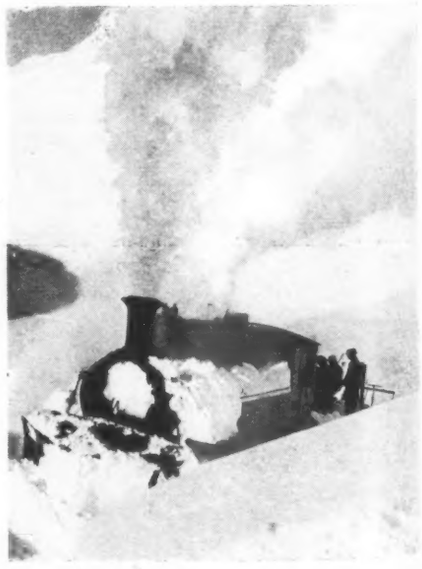


Photo by J. Haemisegger

Snowplow of the Furka-Oberalp Railway, Switzerland, Clears the Tracks for Skiers' Trains

Continued on next left-hand page

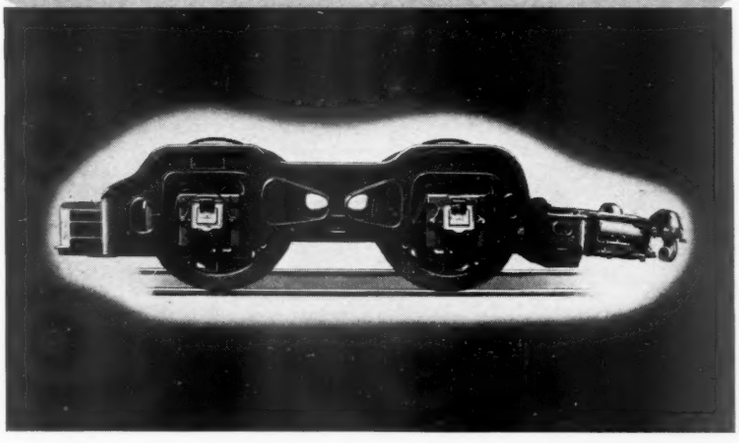
YOU CAN COMBINE ALL 3

high starting capacity

high capacity at high speed

low driving axle load

In a modern locomotive design, with minimum weight on driving axles, you can have high starting capacity and high capacity at high speeds. » » » While minimum weight on driving axles inevitably results in lower starting power, this lack is made up by the Locomotive Booster. » » » Such a locomotive causes minimum stresses on rail, is economical to operate and maintain, and is highly efficient throughout its entire range of operating speeds.



Franklin parts fit—in applying them there is no labor cost for fitting. They are built to original dimensions of carefully selected materials—they avoid road failures and excessive maintenance.

FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Supply Trade

Baldwin Locomotive Annual Report

The Baldwin Locomotive Works reported for the year ended December 31, 1937, a consolidated net profit after provision for depreciation and interest, of $407,377. This is after adjustment of a profit accrued to the consolidated income account by the equity of minority stockholders in the net profit of the Midvale Company less the loss of the Whitcomb Locomotive Company, both subsidiaries. This compared with a consolidated net loss of $2,163,949 in 1936.

Consolidated sales during the year, exclusive of inter-company transactions, totaled $36,586,462, compared with $20,877,736 in 1936. Of these, sales of locomotive products amounted to $15,259,800, or 42 per cent of the total volume of business done, while, in 1936, but 18 per cent of the total sales of the company were locomotive purchases. Unfilled orders for new locomotives and tenders as of December 31, 1937, totaled $13,512,783.

In his commentary preceding the financial statement, President George H. Houston indicated that the outlook for 1938 is uncertain, and pointed out that although there was a reasonable backlog of orders carried over into 1938 these were concentrated upon certain products only. He further made it known that there were no large orders for locomotives placed during the latter half of 1937 and that orders for other products dropped off sharply during the latter part of the year. Regarding future railroad purchases he said: "Future orders for locomotives will depend largely upon the income of the railroads and the volume of carloadings. The railroads' net operating income has been so reduced in recent months as to leave little leeway for financing the purchase of new equipment. This condition should be greatly improved if the application for increased freight rates, now before the Interstate Commerce Commission, is allowed; but even with improved income arising from such increased rates, the extent to which new orders will be placed will depend, in part, upon recovery in the volume of carloadings. Demand for products other than locomotives is also indeterminate, depending upon a resumption of the modernization and extension of industrial plant facilities. Export demand is more promising than it has been for several years."

Discussing the progress made in re-organization of the company under Section 77B of the Federal Bankruptcy Act, Mr. Houston pointed out that, pursuant to the final order of confirmation entered by the federal district court on September 1, 1937, the provisions of the plan of reorganization allowing for various changes in the first mortgage and specifying exchange of the company's other securities have been carried out. In connection with the issuance of new common stock, he reported that all shares of the new common stock are being issued to voting trustees, by whom, in turn, voting trust certificates are being issued to the holders of old securities for which such new common stock was exchanged.

During the year, the consolidated company received $737,400 in dividends in the Midvale company, and $720,000 from the Standard Steel Works Company. Operations of the Midvale Company (partially owned subsidiary of the Baldwin Locomotive Works) brought a net profit of $1,341,816, according to the annual report of Harry L. Frevert, president. This compared with a net profit of $1,266,168 in 1936.

The consolidated statement of profit and loss of the Baldwin Locomotive Works for the year ended December 31, 1937, follows:

The Baldwin Locomotive Works

Consolidated Statement of Profit and Loss for the Year Ended December 31, 1937

Sales		$36,586,462
Less:		
Cost of Sales, including Selling, Administrative and General Expenses	$32,282,936	
Provision for Depreciation	1,850,468	
		34,133,404
Operating Profit		$2,453,058
Other Income:		
Dividends	$26,870	
Interest and Discount	118,768	
Miscellaneous	46,486	
		192,124
Operating Profit and Other Income		$2,645,182
Other Expenses:		
Interest	$622,846	
Miscellaneous (including profit participation for officers and other employees accrued by subsidiary companies, $293,433).	373,369	
Provision for Federal and Pennsylvania Income Taxes of Subsidiary Companies (including Federal Surtax on undistributed profits, $63,300)	726,200	
		1,722,415
Net Profit for the Year		$922,767
Equity of Minority Stockholders in:		
Net Profit of The Midvale Company	$516,303	
Loss of The Whitcomb Locomotive Company	913	
		515,390
Profit Accrued to The Baldwin Locomotive Works Consolidated		$407,377

George Kemme, railway sales and service engineer for the **Standard Oil Company,** Minneapolis division, with headquarters at Minneapolis, Minn., has retired under the company's annuity plan.

The Flexrock Company, Philadelphia, Pa., has opened a new branch with warehouse carload stock, in the Peachtree Arcade building, Atlanta, Ga., in charge of **J. F. Prince,** southern sales manager.

George H. Bucher, executive vice-president of the **Westinghouse Electric & Manufacturing Company,** has been elected president to succeed **Frank A. Merrick,** who becomes vice-chairman of the board, both with headquarters at Pittsburgh, Pa. Paul J. Myler, president of the Canadian Westinghouse Company, has been elected a director of the Westinghouse Electric & Manufacturing Company.

Standard Equipments, Inc., exclusive sales agents for the Evertite rail joint, on March 1, will consolidate its New York office with its Chicago office, at 310 South Michigan avenue. There will be no change in personnel; **C. O. Bradshaw,** president, and **A. E. Hill,** Western manager both will have their headquarters at Chicago.

D. J. Crowley, formerly special representative of **Hubbard & Company,** Pittsburgh, Pa., with headquarters at Chicago, has organized the **Universal Spring Washer & Supply Company,** 6 North Michigan avenue, Chicago, to manufacture and sell the Universal spring washer, heretofore sold by Hubbard & Company.

OBITUARY

Edgar W. Brown, eastern sales manager of the Primary Battery Division of Thomas A. Edison, Incorporated, Bloomfield, N. J., died of pneumonia on February 3, in a hospital at Montclair, N. J. He was born at Troy, N. Y., on August 2, 1870, and after graduation from Boy's Academy, Lansingburg, N. Y., served with the General Electric Company, Schenectady, N. Y., and subsequently with the Stanley Electric Manufacturing Company, Pittsfield, Mass., and the electrical repair department of the Metropolitan Traction Company, New York City. In 1899 Mr. Brown was with the Cape Town Tramway Company, Cape Town, South Africa, and from 1900 was with the Otis Elevator Company, until 1903 when he joined the Thomas A. Edison Industries, serving this company continuously until the time of his death.

Charles W. Hotchkiss, director of the National Malleable & Steel Castings Company, Cleveland, Ohio, who had served in various positions with that company and its predecessors for more than 25 years, died on February 19, at his home in Cleveland Heights, at the age of 68. After leaving the Kenyon Military School, Mr. Hotchkiss entered the employ of the Cleveland Malleable Iron Company, one of the predecessor companies of the National Malleable & Steel Castings Company. He served in various positions for a period of about 15 years and in 1905, was promoted to superintendent of the company's Cleveland plant, where he remained for five years and then became plant manager. Fourteen years later, Mr. Hotchkiss was appointed production manager for all of the plants of the National Malleable & Steel Castings Company, from which position he retired in 1930, but retained his directorship.

TRADE PUBLICATIONS

PNEUMATIC EQUIPMENT.—A complete description of its line of pneumatic equipment adapted to roadway maintenance,

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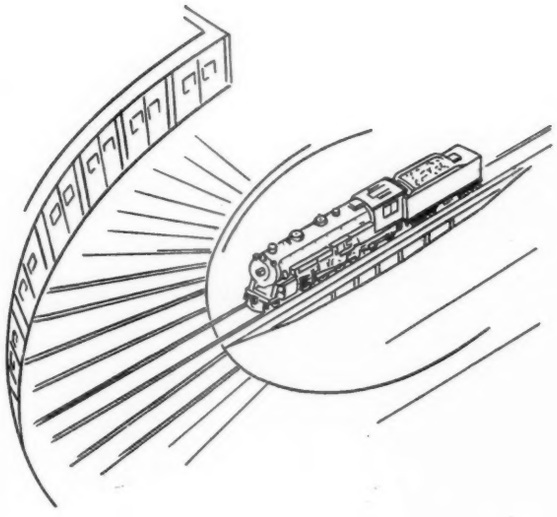
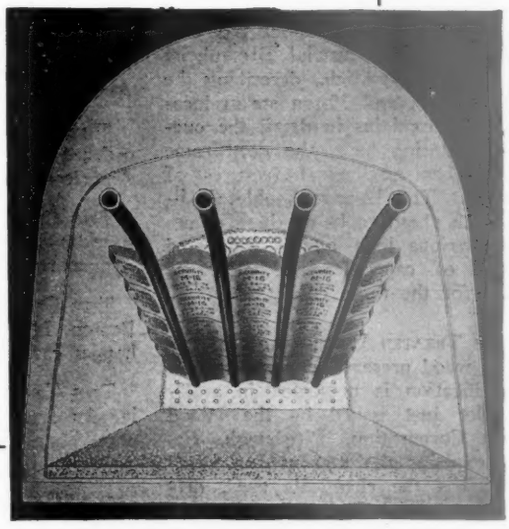
BE SURE
No Arch Brick
Is Missing





There's More to SECURITY ARCHES *Than Just Brick*

In these days of rigid economy, don't draw the line too fine and let a locomotive leave the roundhouse with an imperfect Arch due to lack of supplies.

A single missing Arch Brick has a mighty serious effect on steaming and on the efficiency of the locomotive.

Today, a dollar's worth of fuel means more than ever before. To spend it effectively, every Locomotive Arch should be maintained in perfect condition.

Be sure your stocks on hand are ample to provide fully for all locomotive requirements, so that locomotive efficiency will not suffer.

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

AMERICAN ARCH CO.
INCORPORATED
60 EAST 42nd STREET, NEW YORK, N. Y.
Locomotive Combustion Specialists

rail laying and bridge work is attractively set forth in Bulletin 9523 recently issued by the Ingersoll-Rand Company, New York. The 40-page booklet devotes three pages to the organization and economies of tamping gangs, in addition to descriptions and explanations of gasoline and oil-powered compressors in a variety of sizes, tie tampers, spike drivers and spike pullers, track wrenches, rail drills and rail bonding drills, scaling tools and wire brushes, chipping hammers, rivet-busters, and sump pumps.

OKONITE INSULATION.—The Okonite Company, Passaic, N. J., manufacturer of insulated wires and cables, has published a new book entitled "Okonite Insulation." It describes not only how Okonite rubber insulation is made, but also gives tables on resistance, thickness, diameters and installation data pertinent to rubber insulated cables for service up to 5,000 volts.

DIRECT-CURRENT MOTORS.—Construction details of the direct-current motors developed by Fairbanks, Morse & Co., Chicago, are described and illustrated in Bulletin 2260, available on request from that company. The line of motors, designed to meet a wide range of requirements, comprises ratings up to 200 hp. with mechanical modifications for both high and low voltage operation.

LOCOMOTIVE CRANES.—Booklet No. 385, just issued by the Industrial Brownhoist Company, Bay City, Mich., describing the company's 20, 25, and 30-ton steam locomotive cranes, explains in detail the one-piece steel rotating beds, the deep-frame cars, and other mechanical features of these cranes. The 12-page booklet is illustrated with photographs of these cranes in use at various jobs, and is completed with tables of capacities and clearance dimensions for the three cranes.

PRESSURE TREATED WOOD.—A brief exposition of wood preservation and its economic justification is presented in a 20-page booklet just issued by the Wood Preserving Corporation, Pittsburgh, Pa. The text explains the reasons for treatment, describes the chemicals used, differentiates between the full cell and empty cell processes, and outlines the precautions taken in preparing wood for treatment. A discussion of the economies of treatment is accompanied by illustrations of a variety of engineering works in which treated wood has been used.

Construction

MISSOURI PACIFIC LINES.—This company now has under construction at Brownsville, Tex., with company forces, a vegetable packing plant which, together with the necessary trackage, driveways, etc., is being built at a cost of about $39,000. This project is now nearing completion.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO, ROCK ISLAND & PACIFIC was authorized by the federal district court at Chicago on February 18 to enter into an agreement with the Electro-Motive Corporation to lease ten Diesel switching locomotives for a period of seven years, with an option to purchase. They include eight 100-ton, 600-hp. and two 125-ton, 900-hp. locomotives. The gross rental for each of the 100-ton locomotives will be $67,500 and the total rental on the larger ones will be $88,000 each. The rent is payable in monthly installments, including a rate of 4 per cent interest on the unpaid balance. At the conclusion of the rental period, the road may purchase the locomotives at a nominal cost. The petition of the road stated that ten Diesel switching locomotives, similar to the 100-ton locomotives contemplated, were leased from the Electro-Motive Corporation on April 20, 1937, resulting in a savings of approximately $1,000 a month to the road after the payment of rental.

FREIGHT CARS

THE NIAGARA SMELTING CORPORATION has ordered one tank car from the General American Transportation Corporation.

THE SHELL CHEMICAL COMPANY has ordered four tank cars from the General American Transportation Corporation.

THE CANFIELD TANK LINE has ordered four tank cars from the General American Transportation Corporation.

THE EASTERN GAS & FUEL ASSOCIATES, Boston, Mass., are inquiring for 50 steel hopper cars of 50 or 70 tons' capacity.

THE UNITED FRUIT COMPANY is inquiring for from five to ten tank cars, for export.

THE CANADIAN NATIONAL has placed orders for 2,000 steel sheathed box cars, with wood linings and ceilings, of 45 tons' capacity, to be delivered during the coming spring. The Eastern Car Company received orders for 700, the National Steel Car Corporation, 700, and the Canadian Car & Foundry Co., 600. These cars will be wider and higher than the 3,000 built last year. They will have a length of 40 ft. 6 in., and will be 9 ft. 2 in. wide and 10 ft. high, with a capacity of more than 3,700 cu ft. The weight of the car will be 1,700 lb. lighter than the previous lot. Inquiry for this equipment was reported in the *Railway Age* of December 25, page 930.

SIGNALING

THE FLORIDA EAST COAST has placed an order with the General Railway Signal Company covering A. P. B. color-light signals to be installed between Edgewater, Fla., and Titusville. Included in the order are Type-D color-light signals, Type-K relays, Type-L resistors, Type-B lightning arresters, instrument housings and other incidental materials.

IRON AND STEEL

THE LOUISVILLE & NASHVILLE is inquiring for 314 tons of structural steel for an overhead crossing at East St. Louis, Ill.

THE SOUTHERN PACIFIC has ordered 330 tons of structural steel for a bridge at Compton, Cal., from the Columbia Steel Company.

Financial

AKRON, CANTON & YOUNGSTOWN.—*Ratification of Trustee.*—The Interstate Commerce Commission, Division 4, has ratified the appointment of H. B. Stewart, Jr., as trustee of this company, and of the Northern Ohio.

ALABAMA, TENNESSEE & NORTHERN.—*Trustee.*—John T. Cochrane, Jr., has applied to the Interstate Commerce Commission for ratification of his appointment as trustee of this property.

BEVIER & SOUTHERN.—*Operation.*—The Interstate Commerce Commission, Division 4, has authorized this company to operate 1.3 miles of its line in Macon County, Mo. The commission has also authorized this company to operate, under lease, the line of the Binkley Mining Company, 0.6 mile, in the same county.

CARLTON & COAST.—*Bonds.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend from May 1, 1936, to May 1, 1941, the date of maturity of $468,377 of first mortgage 6 per cent bonds now pledged as collateral security for loans from the Reconstruction Finance Corporation.

CENTRAL OF NEW JERSEY.—*Bond.*—The Interstate Commerce Commission, Division 4, has authorized this company to extend from March 1, 1938, to March 1, 1941, the date of maturity of $750,000 remaining unpaid on a bond of $1,250,000.

CHICAGO & NORTH WESTERN.—*Report to Stockholders.*—President Fred Sargent has sent to the stockholders a four-page annual report of this company's operations for 1937, showing operating revenues of $89,802,536 and operating expenses of $81,354,132. Net railway operating income totaled only $37,401, and the deficit after fixed charges was $14,811,098. Relative to reorganization plans, President Sargent wrote, in part, as follows:

> Hearings before the Interstate Commerce Commission on a plan of financial reorganization, which began September, 1936, have been held from time to time during the year. At the December hearing the Company filed an amended plan of reorganization which had been approved and adopted by your Board of Directors on October 13, 1937, in place of the original plan which had been submitted in June, 1936. After treatment of outstanding obligations to creditors

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The same locomotive equipped with a Type "E" Superheater rather than with a Type "A" Superheater will have—

8%-14% *More* Evaporating Capacity, *and* 50%-80% *More* Superheating Capacity

ELFESCO A-1210 THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.
60 East 42nd Street, NEW YORK 122 S. Michigan Avenue, CHICAGO
Canada: THE SUPERHEATER COMPANY, LTD., MONTREAL

Superheaters – Exhaust Steam Injectors – Feed Water Heaters – American Throttles – Pyrometers – Steam Dryers

in a manner which is felt to be wise, fair and equitable, this plan proposes that the present outstanding preferred stock be exchanged, two shares for one of new Class C 4% preferred stock, and that the present outstanding common stock be exchanged, four shares for one of new no-par common stock.

Both the original plan and the amended plan of the Company have met with determined opposition by certain creditors and at the December hearing representatives of the Life Insurance Group Committee and of the Mutual Savings Bank Group Committee, acting jointly, filed a proposed plan which contemplates issuance of new fixed charge obligations in a much larger amount than does the Company's amended plan and which requests denial of participation in reorganization by present stockholders on any basis.

Your Board of Directors and management will continue to endeavor not only to keep faith with the Company's creditors but also to preserve for the stockholders the ultimate equity which is believed to be inherent in this property, with its long, enviable record of solvency and prosperity and with its fine physical plant which has been adequately maintained and is amply equipped to handle its reasonable share of the increased traffic which will surely ensue when the country returns to more normal economic conditions.

CHICAGO, ROCK ISLAND & PACIFIC.—*Reorganization.*—The Interstate Commerce Commission, Division 4, has authorized the Marine Midland Trust Company of New York and the Continental Illinois National Bank & Trust Company of Chicago to intervene in the reorganization proceedings of this company.

CHICAGO, ROCK ISLAND & PACIFIC.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized the trustees of the Choctaw, Oklahoma & Gulf to abandon the branch line extending from Pittsburg, Okla., to Frisco Junction, 84.5 miles, together with a sub-branch extending from North Coalgate, Okla, to Coalgate, 1.6 miles, and the westerly end of the branch at Ardmore, 1.5 miles. The commission has also authorized the trustees of this company to abandon operation of the line extending from Pittsburg, Okla., to Ardmore, together with the sub-branch above-mentioned, 99.9 miles.

COLORADO & SOUTHERN.—*Abandonment.*—This road has applied to the Interstate Commerce Commission for permission to abandon a 3.92-mile segment of its Sopris branch between Trinidad, Colo., and Sopris, and to substitute therefor operation over the "nearby and substantially parallel lines" of the Atchison, Topeka & Santa Fe and the Colorado & Wyoming.

Acquisition.—The road has also applied for authority to acquire control of the Fort Worth & Denver Terminal by purchase of 141 shares of the latter's stock from the Fort Worth & Denver City for $14,100.

R. F. C. Loan.—This company has applied for Interstate Commerce Commission approval of a $1,072,000 loan which it is seeking to obtain from the Reconstruction Finance Corporation.

CRYSTAL RIVER.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon its entire line extending from Carbondale, Colo., to Placita, 20.7 miles.

DENVER & RIO GRANDE WESTERN.—*R. F. C. Loan.*—The trustees have applied to the Reconstruction Finance Corporation for a loan of $1,800,000, the proceeds to be used for the rehabilitation of the property.

DULUTH, MISSABE & IRON RANGE.—*Merger.*—Interstate Commerce Commission hearings in connection with the proposal to merge the properties of the Duluth & Iron Range and the Interstate Transfer into this company will be held at Washington, D. C., on March 3.

HICKORY VALLEY.—*Abandonment.*—This company has applied to the Interstate Commerce Commission for authority to abandon a line from West Hickory, Pa., to Endeavor, 3 miles.

LOUISIANA SOUTHERN.—*Abandonment.*—The receiver for this road has applied to the Interstate Commerce Commission for authority to abandon 28.2 miles of main line from Braithwaite, La., to Point-A-La-Hache, and an 8.7-mile branch line from Poydras Junction to Reggio.

MINNEAPOLIS, RED LAKE & MANITOBA.—*Abandonment.*—Examiner R. Romero of the Interstate Commerce Commission, in a proposed report to the commission, has recommended that it authorize this company to abandon its entire line extending from a connection with the Great Northern at Bemidji, Minn., to Redby, 32.3 miles. The examiner also recommends that the road be permitted to abandon operation, under trackage rights, over the line of the Great Northern at Bemidji, 3.4 miles.

PENNSYLVANIA.—*Annual Report.*—The annual pamphlet report of this company for 1936 has been issued and a summary of it is published in the advertising pages herein. The company reported net income of $27,278,638, a decrease of 29.6 per cent under 1936. Operating revenues at $455,933,509 were up 3.3 per cent, but operating expenses at $382,932,582 were 7.2 per cent higher. Net railway operating income totaled $73,000,927, a decrease of 13.3 per cent.

PEORIA & EASTERN.—*Promissory Note.*—This company has applied to the Interstate Commerce Commission for authority to issue its 5 per cent promissory note, dated March 30 and due April 1, 1940, for $500,000, and to issue and pledge as partial collateral therefor $500,000 of its first consolidated 50-year 4 per cent bonds. Proceeds of the note, which it is proposed to sell by competitive bidding, would be used to meet the April 1 maturity of the Ohio, Indiana & Western's first mortgage 50-year 5 per cent gold bonds.

PITTSBURGH & WEST VIRGINIA.—*Notes.*—The Interstate Commerce Commission, Division 4, has authorized this company to issue, reissue, extend, or renew, at par, a promissory note or notes in a total face amount of $250,000, at any time outstanding.

ST. LOUIS-SAN FRANCISCO.—*Bond Interest*—Trustees for the St. Louis-San Francisco on February 16 applied to the federal district court at St. Louis for authority to pay $156,010 interest due March 1 on bonds of the Kansas City, Memphis & Birmingham. The trustees also seek to make interest payments on general mortgage, assented income and unassented income bonds of the Kansas City, Memphis & Birmingham which matured in 1934 but which have not been paid.

SHREVEPORT, HOUSTON & GULF.—*Abandonment.*—The Interstate Commerce Commission, Division 4, has authorized this company to abandon its entire line, extending from Manning, Tex., to Prestridge and Huntington.

SOUTHERN PACIFIC.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to guarantee the principal and outstanding interest of $2,500,000 of first mortgage 50-year 5 per cent gold bonds of the El Paso & Rock Island and $577,000 of first mortgage and collateral trust 50-year 5 per cent gold bonds of the Dawson Railway & Coal Co.

UNION PACIFIC.—*Acquisition.*—The Los Angeles & Salt Lake has applied to the Interstate Commerce Commission for authority to extend its line from Pioche, Nev., 8.69 miles to Prince Mine by purchase of a line from the Prince Consolidated Mining Company. It is also proposed to construct a 6,812-ft. mine spur leading from the line acquired to a mine of the Combined Metals Reduction Corporation, and 1,811 ft. of secondary track. The application also seeks authority for the Union Pacific to operate the extension under the lease whereby it operates the L. A. & S. L.

WABASH.—*Reorganization Plan.*—The federal district court at St. Louis, Mo., has set March 15 as the final date for filing objections to the modified plan of reorganization submitted to the court on February 15.

WESTERN PACIFIC.—*R. F. C. Loan.*—This company has applied for Interstate Commerce Commission approval of a $3,600,000 Reconstruction Finance Corporation loan. The road desires to have $1,000,000 by March 15 and the balance from time to time during the six following months; the proceeds will be used to pay for rehabilitating the road and its equipment.

YOSEMITE VALLEY.—*Reorganization.*—The Interstate Commerce Commission, Division 4, has authorized the payment of $2,600 to Howard C. Bonsall for his services as trustee and $750 to William B. Rodda as counsel for the trustee in the reorganization proceedings of this company.

Average Prices of Stocks and Bonds

	Feb. 23	Last week	Last year
Average price of 20 representative railway stocks..	31.19	29.77	56.38
Average price of 20 representative railway bonds..	63.91	63.57	84.06

Dividends Declared

Boston & Albany.—$2.00, payable March 31 to holders of record February 28.

Canadian Pacific.—Preferred, 2 per cent, payable April 1 to holders of record March 1.

Chesapeake Corporation.—75¢, payable April 2 to holders of record March 8.

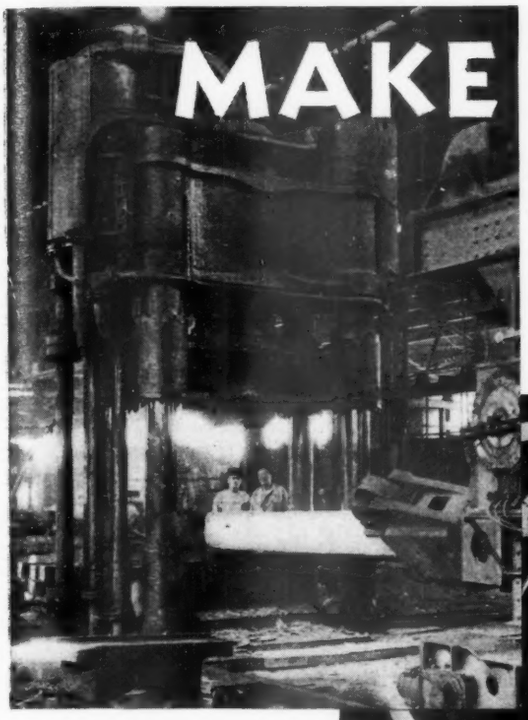
Chesapeake & Ohio.—75¢, quarterly; Preferred, $1.00, quarterly, both payable April 1 to holders of record March 8.

Dayton & Michigan.—8 Per Cent Preferred, $1.00, quarterly, payable April 6 to holders of record March 16; Common, 87½¢, semi-annually, payable April 1 to holders of record March 16.

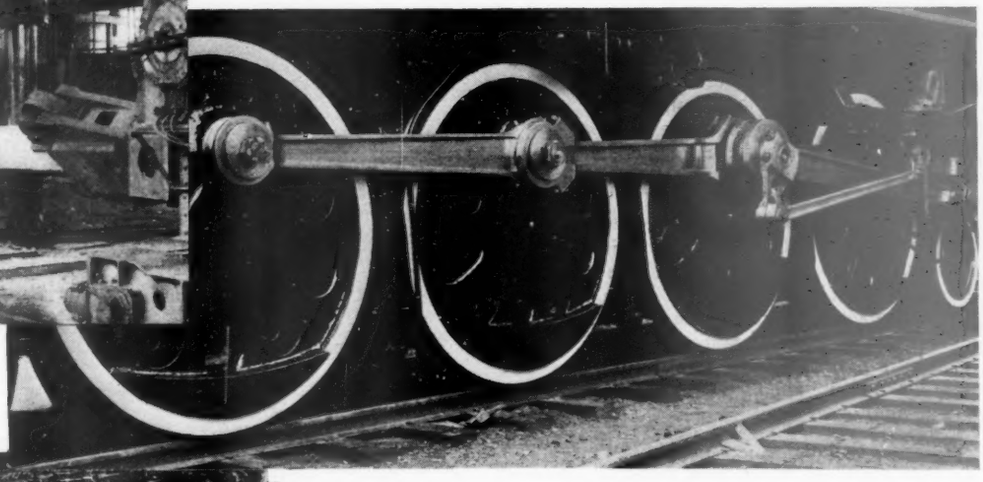
Delaware & Bound Brook.—$2.00, quarterly, payable February 21 to holders of record February 15.

Erie & Pittsburgh.—87½¢, quarterly, payable March 10 to holders of record February 28.

Continued on next left-hand page



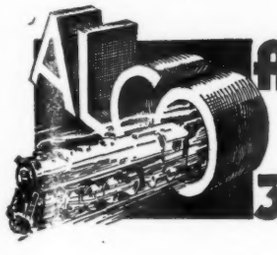
MAKE *Every* DOLLAR DO FULL DUTY *Specify* ALCO FORGINGS



ALL DOLLARS spent for forgings are not equal in value after they are spent. Money spent for forgings, that have demonstrated their ability to last longest in hard service, give utmost protection against engine failures, reduce the cost of running and classified repairs, will unquestionably give greatest return per dollar. That's exactly how ALCO Forgings have performed for many years—they have added dependability to and reduced the cost of operating thousands of locomotives.

ALCO Forgings are economical also, because you get this extra value, strength and durability at less cost than you can equip, maintain and operate your shops to manufacture forgings of similar high quality.

Stick to quality—make every dollar do full duty—specify ALCO Forgings.



AMERICAN LOCOMOTIVE COMPANY

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Railway Officers

FINANCIAL, LEGAL AND ACCOUNTING

F. C. Sharood, assistant general auditor of the Northern Pacific, has been appointed to the newly-created position of deputy general auditor, with headquarters as before at St. Paul, Minn. **F. W. Stetekluh,** auditor of disbursements, has been promoted to assistant general auditor to succeed Mr. Sharood, and **G. E. Lees,** assistant auditor of disbursements, has been promoted to auditor of disbursements to replace Mr. Stetekluh.

Mr. Sharood first entered railroad service in 1894 as a messenger in the telegraph department of the Northern Pacific. Later he served with the Great Northern, the Chicago Great Western and the Virginian, and from 1910 to 1919 he was connected with the Interstate Commerce Commission as an accountant. Early in 1920 he returned to the Northern Pacific as valuation accountant and later in the same year he was promoted to assistant general auditor, which position he continued to hold until his recent appointment as deputy general auditor.

Martin Eckert, who has been appointed general auditor of the Missouri Pacific at St. Louis, Mo., as reported in the *Railway Age* of February 12, was born on September 6, 1873, at Columbia, Ill., and was educated in the public schools

Martin Eckert

and business college at Belleville, Ill. He was for a time engaged as a Western Union messenger before entering railway service in 1891 as a telegraph operator and ticket clerk at Belleville for the Louisville, Evansville & St. Louis (now a part of the Southern). In 1893, he was transferred to East St. Louis, Ill., as telegrapher and dispatcher, becoming a year later chief clerk to the agent of the Southern at that point. He moved to the Missouri-Kansas-Texas in 1898, as a clerk in the accounting department at St. Louis, and in 1902, he went with the Wabash in a similar capacity at the same place. He entered the accounting department of the Missouri Pacific's Gulf Coast Lines in 1908, as chief clerk at Beaumont, Tex., and became general auditor, with headquarters at Houston, Tex., in 1918, holding this position until his recent promotion. In addition, he served as auditor of the Houston Belt & Terminal since 1920, and as general auditor of the International-Great Northern, (both units of the Missouri Pacific) since 1935.

A. E. Lawler, who has been promoted to general auditor of the Illinois Central, as reported in the *Railway Age* of February 19, was born in Lexington, Tenn., on August 15, 1885. After graduation from

A. E. Lawler

the Jackson, Tenn., public schools and from Union University, he entered the service of the Illinois Central on December 11, 1906, as assistant timekeeper in the superintendent's office at Memphis, Tenn. He later rose successively through the positions of chief timekeeper, assistant chief clerk to superintendent, division accountant, and chief clerk to superintendent. He was made traveling auditor on December 16, 1918, and six months later he became chief traveling auditor of the Northern and Western lines, with headquarters at Chicago. His jurisdiction was extended to the entire railroad on March 1, 1920. In 1931, when consolidations were made in the accounting department, Mr. Lawler took charge of the grand divisional accounting offices at Champaign, Ill., Memphis, Tenn., and Waterloo, Iowa, as well as of the superintendent's accounting force at Chicago. On April 1, 1932, he was promoted to auditor of disbursements, and held this post at the time of his recent advancement.

TRAFFIC

D. Y. Smith, assistant freight traffic manager of the Central of New Jersey, with headquarters at New York, has been appointed freight traffic manager, with headquarters at New York. **A. S. Huntington,** assistant general freight agent at New York, has been appointed assistant freight traffic manager, succeeding Mr. Smith. **C. N. Bissell** has been appointed assistant to general freight agent. The position of assistant general freight agent, formerly held by Mr. Huntington, has been abolished.

OPERATING

E. P. Dudley, acting superintendent of the Colorado division of the Atchison, Topeka & Santa Fe, with headquarters at Pueblo, Col., has been appointed superintendent of the same division, effective February 20.

C. Metcalf has been appointed assistant superintendent of the Hornepayne division of the Canadian National, with headquarters at Hornepayne, Ont., succeeding **A. J. Lomas,** who has been transferred in the same capacity to the Capreol division, with headquarters at Capreol, Ont. Mr. Lomas succeeds **S. J. Faught** who has been granted a leave of absence on account of illness.

ENGINEERING AND SIGNALING

J. E. Fanning, assistant engineer on the Illinois Central, with headquarters at Waterloo, Iowa, has been promoted to division engineer, with the same headquarters, to succeed **H. Rhoads,** whose death on February 6 at Dubuque, Iowa, was reported in the *Railway Age* of February 12

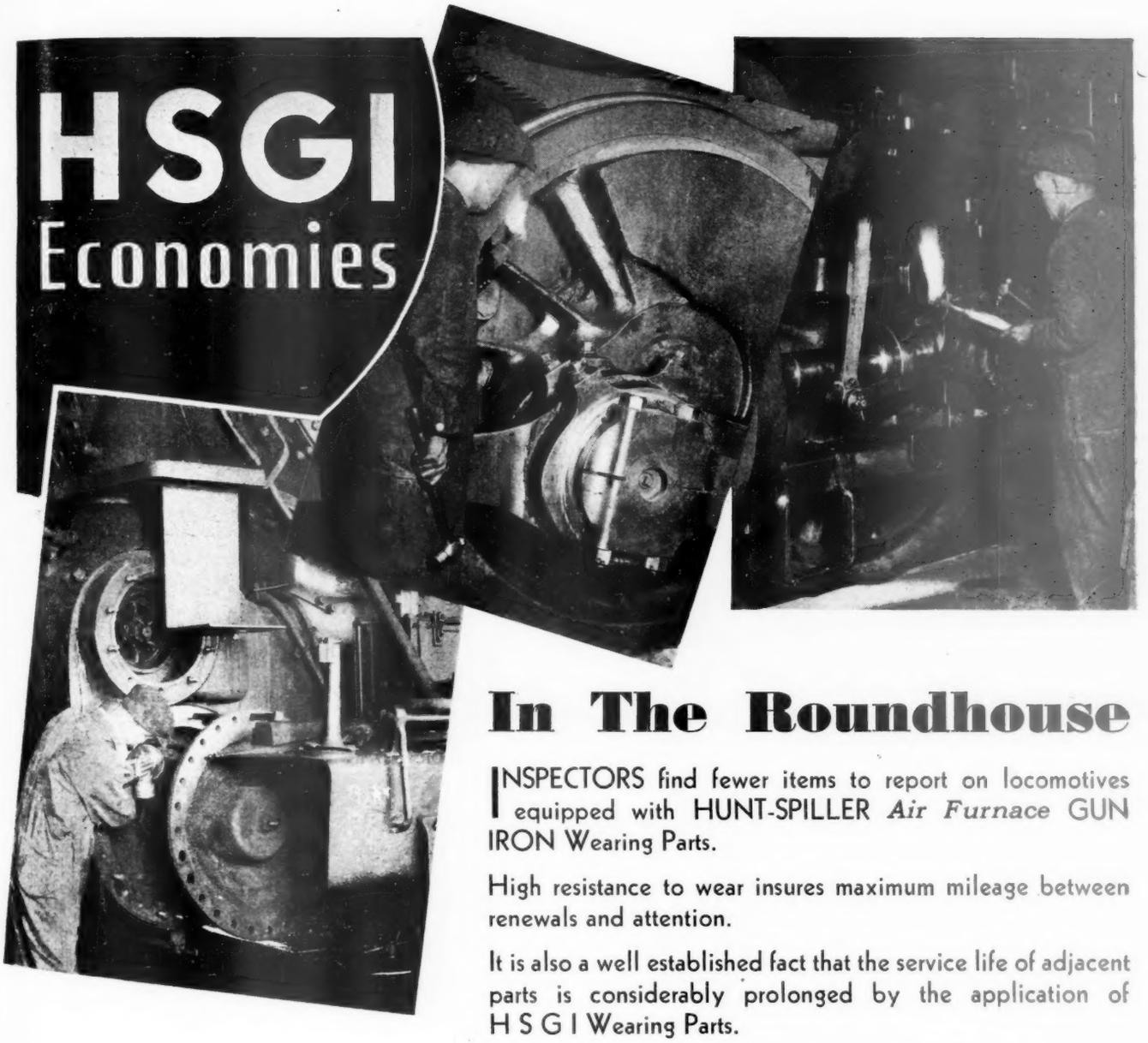
Frank L. Guy, whose promotion to engineer maintenance of way and structures of the Pacific lines of the Southern Pacific was reported in the *Railway Age* of February 5, was born in Gallipolis, Ohio, on March 16, 1883. He received his education in the public and high schools of Topeka, Kan., and at the University of Kansas, and entered railway service in August, 1901, with the Atchison, Topeka & Santa Fe as a chainman. During the years that followed he served various western railroads, advancing from the position of axeman to rodman, transitman, assistant engineer, and locating engineer. In July, 1914, he was made division engineer of the El Paso & Southwestern (now a part of the Southern Pacific), and in November, 1924, he became division engineer for the Southern Pacific. He will continue to make his headquarters at San Francisco, Cal.

MECHANICAL

R. R. Royal, master mechanic on the Illinois Central, with headquarters at Paducah, Ky., has been appointed shop superintendent at the same point, to succeed **Eugene C. Roddie,** who has retired. **P. O. Christy,** assistant master mechanic at the enginehouse at Markham Yard (Chicago), has been appointed master mechanic at Paducah, to succeed Mr. Royal. **A. D. Haley,** general foreman at McComb, Miss., has been appointed assistant master mechanic at Markham Yard, to succeed Mr. Christy.

Table of Operating Revenues and Expenses appears on next left-hand page

HSGI Economies



In The Roundhouse

INSPECTORS find fewer items to report on locomotives equipped with HUNT-SPILLER *Air Furnace* GUN IRON Wearing Parts.

High resistance to wear insures maximum mileage between renewals and attention.

It is also a well established fact that the service life of adjacent parts is considerably prolonged by the application of H S G I Wearing Parts.

Locomotives equipped with the complete line of H S G I parts require minimum roundhouse attention.

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Cylinder Bushings
Cylinder Packing Rings
Pistons or Piston Bull Rings
Valve Bushings
Valve Packing Rings
Valve Bull Rings
Crosshead Shoes
Hub Liners
Shoes and Wedges
Floating Rod Bushings
Parts Finished For Application
Dunbar Sectional Type Packing
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(Duplex Springs for Above
Sectional Packing)
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HUNT-SPILLER *Air Furnace* GUN IRON

Operating Revenues and Operating Expenses of Class I Steam Railways

Compiled from 137 Monthly Reports of Revenues and Expenses Representing 141 Class I Steam Railways

FOR THE MONTH OF DECEMBER, 1937 AND 1936

Item	United States		Eastern District		Southern District		Western District	
	1937	1936	1937	1936	1937	1936	1937	1936
Miles of road operated at close of month	235,052	235,665	58,089	58,320	44,744	44,816	132,219	132,529
Revenues:								
Freight	$231,328,683	$299,111,202	$93,316,967	$130,013,571	$47,964,672	$58,801,192	$90,047,044	$110,296,439
Passenger	39,933,071	39,260,890	21,617,469	21,645,666	5,723,360	5,796,628	12,592,242	11,818,596
Mail	10,403,897	10,454,997	3,911,546	3,931,909	1,723,938	1,762,655	4,768,413	4,760,433
Express	4,732,198	6,190,697	1,694,980	2,600,249	948,223	1,292,094	2,088,995	2,298,354
All other transportation	6,661,321	8,390,102	3,225,458	3,903,709	834,613	925,694	2,601,250	3,560,699
Incidental	6,654,190	7,942,823	3,547,071	3,512,693	936,030	895,465	2,171,089	3,534,665
Joint facility—Cr.	877,698	1,024,843	293,211	306,534	123,848	186,581	460,639	531,728
Joint facility—Dr.	270,237	241,149	66,531	52,750	20,433	21,812	183,273	166,587
Railway operating revenues	300,320,821	372,134,405	127,540,171	165,861,581	58,234,251	69,638,497	114,546,399	136,634,327
Expenses:								
Maintenance of way and structures	33,419,418	33,847,453	13,940,133	13,582,616	6,038,609	6,227,124	13,440,676	14,037,713
Maintenance of equipment	60,789,043	69,315,874	27,897,082	33,063,602	10,960,603	12,512,753	21,931,358	23,739,519
Traffic	9,129,446	8,800,430	3,285,263	3,273,663	1,780,398	1,709,147	4,063,785	3,817,620
Transportation	125,717,363	128,929,359	55,729,083	59,334,672	20,803,665	21,091,582	49,184,615	48,503,105
Miscellaneous operations	3,530,062	3,393,497	1,634,870	1,591,687	435,302	436,278	1,459,890	1,365,532
General	11,344,954	13,434,727	4,449,810	5,867,637	2,155,746	2,397,495	4,739,398	5,169,595
Transportation for investment—Cr.	576,194	441,827	212,266	368,985	84,113	81,194	279,815	*d* 8,352
Railway operating expenses	243,354,092	257,279,513	106,723,975	116,344,892	42,090,210	44,293,185	94,539,907	96,641,436
Net revenue from railway operations	56,966,729	114,854,892	20,816,196	49,516,689	16,144,041	25,345,312	20,006,492	39,992,891
Railway tax accruals	*21,084,941	**32,936,101	8,940,553	16,839,694	3,220,874	7,040,417	8,923,514	9,055,990
Railway operating income	35,881,788	81,918,791	11,875,643	32,676,995	12,923,167	18,304,895	11,082,978	30,936,901
Equipment rents—Dr. balance	7,405,032	7,819,059	3,172,575	3,343,255	420,065	309,672	3,812,392	4,166,132
Joint facility rent—Dr. balance	2,505,230	3,594,196	1,281,649	2,003,651	374,213	406,388	849,368	1,184,157
Net railway operating income	25,971,526	70,505,536	7,421,419	27,330,089	12,128,889	17,588,835	6,421,218	25,586,612
Ratio of expenses to revenues (per cent)	81.03	69.14	83.68	70.15	72.28	63.60	82.53	70.73
Depreciation included in operating expenses	16,813,476	16,078,451	7,542,796	6,868,593	3,192,439	3,197,629	6,078,241	6,012,229
Total maintenance before depreciation	77,394,985	87,084,876	34,294,419	39,777,625	13,806,773	15,542,248	29,293,793	31,765,003
Net railway operating income before depreciation	42,785,002	86,583,987	14,964,215	34,198,682	15,321,328	20,786,464	12,499,459	31,598,841

FOR TWELVE MONTHS ENDED WITH DECEMBER, 1937 AND 1936

Average number of miles operated	235,449	236,225	58,200	58,486	44,788	44,901	132,461	132,838
Revenues:								
Freight	$3,377,908,423	$3,307,123,748	$1,413,212,562	$1,404,363,844	$654,127,249	$650,429,565	$1,310,568,612	$1,252,330,339
Passenger	442,809,306	412,365,686	243,424,820	232,374,905	60,943,012	55,327,779	138,441,474	124,663,002
Mail	97,983,881	95,542,683	37,418,329	36,620,640	17,056,094	16,619,176	43,509,458	42,102,867
Express	57,682,928	60,180,925	23,519,887	24,900,301	11,731,621	12,171,689	22,431,420	23,108,935
All other transportation	89,158,913	86,885,078	45,337,961	44,691,242	9,667,317	9,037,737	34,153,635	33,156,099
Incidental	92,004,986	80,635,882	46,828,975	41,719,379	12,147,606	10,668,587	33,028,405	28,247,916
Joint facility—Cr.	11,744,025	11,315,681	3,615,169	3,450,755	2,184,073	2,392,164	5,944,783	5,472,762
Joint facility—Dr.	3,223,861	2,853,230	683,235	627,466	273,033	261,536	2,267,593	1,964,228
Railway operating revenues	4,166,068,601	4,051,196,453	1,812,674,468	1,787,493,600	767,583,939	756,585,161	1,585,810,194	1,507,117,692
Expenses:								
Maintenance of way and structures	495,593,048	454,448,047	195,661,188	175,990,419	85,688,183	80,961,985	214,243,677	197,495,643
Maintenance of equipment	826,710,534	782,805,609	374,117,550	356,938,098	149,647,521	144,072,366	302,945,463	281,795,145
Traffic	105,478,279	100,038,347	38,783,191	37,206,148	19,853,350	19,377,000	46,841,738	43,455,199
Transportation	1,510,273,424	1,404,934,801	676,732,431	640,407,001	245,644,854	230,340,784	587,896,139	534,187,016
Miscellaneous operations	41,285,649	35,913,690	18,430,586	16,362,560	4,941,385	4,228,835	17,913,678	15,322,295
General	145,344,911	157,184,874	60,129,566	69,000,910	26,595,917	26,888,397	58,619,428	61,295,567
Transportation for investment—Cr.	5,621,521	5,154,993	1,095,188	1,020,999	782,224	846,130	3,744,109	3,287,864
Railway operating expenses	3,119,064,324	2,930,170,375	1,362,759,324	1,294,884,137	531,588,986	505,023,237	1,224,716,014	1,130,263,001
Net revenue from railway operations	1,047,004,277	1,121,026,078	449,915,144	492,609,463	235,994,953	251,561,924	361,094,180	376,854,691
Railway tax accruals	†325,689,094	#319,701,180	143,457,462	139,430,130	68,229,161	66,062,341	114,002,471	114,208,709
Railway operating income	721,315,183	801,324,898	306,457,682	353,179,333	167,765,792	185,499,583	247,091,709	262,645,982
Equipment rents—Dr. balance	95,020,922	94,436,437	39,326,088	42,397,447	3,783,333	3,442,991	51,911,501	48,595,999
Joint facility rent—Dr. balance	36,113,696	39,714,296	19,937,641	21,758,653	3,953,740	4,754,551	12,222,315	13,201,092
Net railway operating income	590,180,565	667,174,165	247,193,953	289,023,233	160,028,719	177,302,041	182,957,893	200,848,891
Ratio of expenses to revenues (per cent)	74.87	72.33	75.18	72.44	69.25	66.75	77.23	74.99
Depreciation included in operating expenses	197,005,542	193,472,308	87,384,477	84,263,983	37,682,510	38,242,551	71,938,555	70,965,774
Total maintenance before depreciation	1,125,298,040	1,043,781,348	482,394,261	448,664,534	197,653,194	186,791,800	445,250,585	408,325,014
Net railway operating income before depreciation	787,186,107	860,646,473	334,578,430	373,287,216	197,711,229	215,544,592	254,896,448	271,814,665

* Includes charges of $3,199,112 under the requirements of the Social Security Act of 1935; also includes charges and credits resulting in a net charge of $1,810,205, because of provisions of the "Carriers Taxing Act of 1937," approved June 29, 1937 and repeal of the Act of August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress). The charges and credits were not handled in a uniform manner by all the carriers and separate totals are not available.

** Includes charges in the total amount of $13,056,078 itemized as follows: $2,030,915 for taxes under the requirements of the Social Security Act of 1935, and $11,025,163 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress).

† Includes charges of $39,585,126 under the requirements of the Social Security Act of 1935; also includes charges and credits resulting in a net charge of $25,163,049, because of provisions of the "Carriers Taxing Act of 1937," approved June 29, 1937 and repeal of the Act of August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress). The charges and credits were not handled in a uniform manner by all the carriers and separate totals are not available.

Includes charges in the total amount of $65,477,924 itemized as follows: $18,220,269 for taxes under the requirements of the Social Security Act of 1935, and $47,257,655 under the requirements of an Act approved August 29, 1935, levying an excise tax upon carriers and an income tax upon their employees, and for other purposes (Public No. 400, 74th Congress).

d Deficit or other reverse items.

Compiled by the Bureau of Statistics, Interstate Commerce Commission. Subject to revision.